

ORAL HISTORIES

Adventures Told By
Montana's
Fisheries Biologists
1941 - 1969

Compiled by
Margie Peterson

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Preface

Oral Histories are interviews where the interviewer attempts to ask questions that will initiate interesting and factual historical events experienced by the person being interviewed. In the following accounts, the interviewer was Art Whitney, a former Fisheries Manager for the Department of Fish and Game. Each account that follows has its own personality, or character, that depicts the careers of some of Montana's fisheries biologists.

The recorded interviews, which were transcribed and edited by Margie Peterson, took place in the early '90s. These oral histories have been edited for readability but not for content.

"My intent for this publication was to give life to the experiences and remembrances of these fisheries biologists, who gave many years and much energy to caring for and preserving the quality of the fishery, as well as the environment, of the state of Montana, while helping preserve the natural habitat. I hope you enjoy reading their reminiscences as much as I did working on them."

Margie, December 2003



Emmett Colley

Emmett began with the Department of Fish and Game in 1941. This interview was conducted on April 19, 1994.

Emmett, let's start with where you grew up.

My Mother came from Colorado over the Mateetse Trail to Fishtail, Montana. Granddad homesteaded a ranch, but in later years he got the "gold bug" and decided to move to Cooke City. Unfortunately, like most gold miners he didn't succeed in becoming rich. When my Dad was a young man, he came from Virginia to the Emigrant area and worked in various places like sawmills and ranches. I was born in Chico Springs, Montana, in 1920. In the early '20s, my Dad was employed by the Fish and Game Department. We lived at the Emigrant Hatchery which was across the river from the present site on the Story Ranch. They moved the Hatchery in 1933 to the present site. We [FWP] don't own the Hatchery anymore, it's been sold to a private individual.

Were you at the Hatchery when it was moved to the other site?

No, at that time, they only worked half a year. So, we didn't reside at the Hatchery, only the manager resided at the Hatchery.

Wasn't one of the Hatchery sites on the wrong land?

That was probably on the old Story Ranch. There's quite a large area now around the Hatchery. It was purchased from W. T. Anderson. I remember when I was a child the Emigrant Creek would go dry in the summer. The landowners would take all the water out of the creek and I'd go out and rescue all the fish. I had a little pond that I put them in to save them. I would take the old eggs, the eggs that they'd picked off the fish Hatchery and I'd pick out the good eggs so I could hatch some. As Vern Campbell used to say, the eyed eggs were normal and as I was picking the dead eggs out, he called them pallbearers. There weren't many, but there were a few. So I picked the good eggs out of the bad ones and I'd hatch them and then I'd put them in another little pond. I became so interested that I decided I wanted to work for the Department of Fish and Game.

In 1939, my Father was moved to the Great Falls Hatchery and I worked at various jobs, dairies, ranches. In the winter of '41, one of the employees quit. I was asked to work at the Hatchery in Great Falls and I couldn't have asked for anything greater than being employed with the

department. You heard the story that I worked three days for nothing. At that time, they paid employees around the 25th of the month, and the fellow who quit decided he was going to take another job on the 28th. So the Hatchery manager said that if I wanted to work three days for nothing, I could have the job. I jumped at the chance. Later, when I retired, you managed to get those three days' pay for me -- it was figured out to be 45 cents an hour.

After the war, I was assigned to the Anaconda Fish Hatchery. Employees would be detailed at various spawning stations throughout the state. I was assigned West Yellowstone both that winter and spring in the following year. Then I transferred to Emigrant Hatchery until fall of 1948 when I became ill with rheumatic fever. I took sick leave for six months and in the spring of 1949, I was transferred to Bluewater Fish Hatchery. I worked at Lewistown and then Great Falls. I remember one day it was about -20 degrees below zero and the manager at Lewistown told me to go out and scrub the fish ponds with a steel brush. I was scrubbing away and the steam was coming off the pond and he kinda leaned over the edge of the pond and said to me, "You see that green spot back there?" and I said, "yes." He said, "Bear down on it." That was one time he pretty near got a brush wrapped around his neck.

In July 1950, there was an opening at Bluewater as a manager so I was assigned to the Bluewater Fish Hatchery as manager for 26 years. In 1977, I became the Hatchery Bureau Chief in Helena. That alone was one of the highlights of my life. George Holton was the assistant administrator. They had a photo of us, you, George and I and it said there was over 100 years of service with these three people in the department. I stayed in Helena until 1986 when I retired after 42 years of service.

Yes, I remember that picture. We all worked for a long time. So to go on with some remembrances, didn't you have some problems with a lady in the fish pond over in Anaconda?

Yes. One day I was grinding feed in the feed room at the Anaconda Hatchery and the manager's daughter came in and said, "There's an old lady in the fish pond out there." I said, "That's alright." She used to come over and cut down dandelions around the fish ponds along the water's edge in the spring when it was warmer and the dandelions would be green. So, I kept on grinding food and I happened to look back out the window and this lady was floating around in the fish pond. It was a circular pond and the water circulated around and around and she had on a heavy flannel dress and it created an air bubble above her shoulders and that was all that kept her from drowning in the pond. I went to pull her out of the fish pond and I thought she'd fallen in and she said, "No, no" and stuck her head in the water. So I jumped in with shoes and all on and drug her out of the water and I had her sitting on the edge of the pond when the manager came out. He helped me get her feet out of the water and on the outside of the pond. He knew where she lived, so he took her home. While he went to get the pickup she managed to get her feet back into the water again. That's how determined she was to end her life. So he took her home and told her family we found her in the fish pond and to keep an eye on her. About two weeks later they found her in Warm Springs Creek. She'd jumped in Warm Springs Creek and drowned. She was successful the second time.

Tell us about your experiences with some of the traps.

We went to West Yellowstone the year we were married in 1946 and in the fall of 1946 we were assigned to the south

fork of the Madison to watch the fish traps. In November when we managed to take all the eggs we wanted, we started out with the traps on a toboggan with the eggs and all our personal belongings. Two of us were pulling the toboggan on snowshoes (my wife didn't have any snowshoes) and the snow was about two feet deep. She started breaking through the snow and just about a mile and a half from the traps we put her on the toboggan. But then we couldn't pull the toboggan; she was not heavy, but the additional weight kept us from pulling the toboggan. She said that was the closest she ever came to leaving me.

In the spring we went back to the main Madison traps and watched the fish traps there. We had to live with the game warden and the state bought our food for us when we were away from the station. He'd go uptown and come back with expensive cheese and steaks for Eileen to cook for us. They called it camp groceries. That was the way in the early days.

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Boyd (Opie) Opheim

Opie started with the Department of Fish and Game in 1945. This interview was conducted on August 27, 1993.

Opie, tell us where you grew up?

My Mother was from Canada, but we lived with relatives in Menson, a small town in west central Minnesota. I graduated from Starbuck High School and joined the draft. We left Minnesota at -11 degrees below zero and five days later we were on our way to the Mojave Desert in the World War I railroad cars with the old stoves in the corner. It was in '41, February. On our way to the Mojave Desert, 40 miles from Barstow, we spent our time digging gun emplacements and chasing rattlesnakes. Our training lasted 13 months and we were all anxious to be discharged.

When you graduated from high school, did you know there was fish and wildlife management?

My only insight was as a guide. We'd have town meetings and the fish and game from Minneapolis/St. Paul would come up and explain why something was happening. The only thing that I realized was a solution was to plant something else.

When did you decide to go to school, when you got out of the Army?

Yes, I had a ski scholarship at the University of Minnesota and stayed there about six weeks. I found out that ski flying wasn't going to be my game. So I joined the Army. After I got out, I decided to go to school for fish diseases. At that time there were very few people who knew anything about fish diseases. I ended up with an AS degree in Forestry from the North Dakota School of Forestry. Then I decided I wanted to work in fish and wildlife. Utah State was the only school that was doing anything then. I enrolled under Dr. Ziegler and thought I might go into fish disease. I eventually went into fisheries management with a minor in upland game birds and wildlife.

My summer employment with the Fish and Wildlife Service was as an aquatic biologist in the Yellowstone and Missouri drainage as well as the black hills of South Dakota. Then I got a job doing creel census on the Madison River with the Fish and Wildlife Service. I wanted to do a study on the food habits of the pelican. The people from Ennis were using airplanes to bomb the pelicans in the mouth of the

Madison. It didn't make sense to me because less than 100 miles away there was a refuge for pelicans. I requested permission and was told to stay away from the pelicans.

Walt Allen was the Superintendent of Fisheries and Chuck Phenicie was the only biologist. I think I was hired because I had taken several courses in biometrics and Chuck had about four years of data that he wanted run. It was quite humorous because I had lost about \$1,800 a year and other benefits to go to work for the state and here I was spending most of my days pounding the calculator. I had noticed the polluted Clark Fork and how tragic it was. The road was awful, too. I was living in my camper trailer and put up a sign that said, "This river was polluted by the Anaconda Company." I propped it up where car headlights shined on it. About three days later, Walt comes with three guys, all in suits. Guess what? I got transferred to the lakes near Red Lodge next to the old hatchery. I wish I had kept that sign.

So you got transferred?

To hide me from the Anaconda Company because they owned all the papers in the state, but one. And the department didn't want my sign in the papers. I worked in Red Lodge with one of the finest wardens I've ever met, Vern Waples. I understood the department hired Vern because he was always poaching elk. We backpacked to most of the lakes carrying boats and nets. I was really in good physical shape when I left that assignment.

Most of these lakes were heavy populations of brook trout that rarely ever got to be 6" or 7". And there were regulations with a length limit on them. The aging data on these fish showed they were five years old or more and at this size. So I got the bright idea if we wanted to increase the fishing pressure up there we should make it just a weight

limit and no size limit. Chuck thought it was a good idea, but didn't think it would be easy. We started trying to sell that 10-lb. limit. A 10-lb. limit would be 256 fish. The regulations were changed.

Where else did you work at the department?

I spent a lot of time in the Helena office. They were going to open a district and the first one they wanted to open was Miles City. I told them that if I get that far east, I'm just going to keep on going. I was given the territory from a few miles east of Billings to the Idaho line.

The first lake trout we found in this area were in Elk Lake. I sent the collection to Dr. Brown at MSU and he sent it to the Smithsonian. They recorded it as the first unit of the lake trout. The problem in trying to manage fish was that the limits were wide open on the grayling, but they were not able to sustain heavy fishing pressure. So Perry got the limit knocked down to two grayling and that shut down the fishery. Most of the roads were gravel and they weren't about to travel 20 miles to catch a grayling. The other problem with the grayling management was the Ennis Federal Fish Hatchery was distributing catchable rainbow. Little or no supervision was going into the introduction of these exotics.

I finally realized it wasn't the fishing that was hurting our fish populations, it was the near complete destruction of fish habitat. So, I started compiling pictures of this destruction. One problem was that the Highway Department had to go where land was cheaper and this put them practically in the floodplains and the river areas. Then they would widen out the river and it would be one continuous straight riffle area only able to sustain very small fish. I was working in Bozeman and we were trying to keep the highway out of the Gallatin River. They were improving

the highway. The effort was useless and they went about it as they wanted. During the next spring runoff, the Gallatin rose up and started washing out the road and the false meanders. So, to fix it, the Highway Department got some wrecked cars from the city dump and tried to stabilize the river with car bodies. After I started showing the pictures they tried to cover the cars with rocks. The conservation districts had a pretty good chance to make recommendations on these projects.

After the headquarters finally opened in Bozeman, I moved from Red Lodge. I was at the headwaters of the Missouri and Big Hole and it was probably the backbone of salmonid fishing in the Continental U.S. I hadn't been there too long and there was this forest epidemic of spruce budworm. I tried to do all the reading I could and found out that spruce budworm is a native insect and only attacks trees in marginal growth areas. I got word that there's a huge fish mortality in the Yellowstone and I got called in to investigate. When I got there, I found dead fish from the park to Big Timber, well over 100 miles of beautiful trout waters. I started collecting aquatic organisms and I could find none in the spray areas, but the areas that were unsprayed had populations of aquatic organisms. So I wrote a report that went over like a led zeppelin. The Forest Service denied everything. The district foresters were traveling the country saying this was a bunch of bologna. They didn't kill fish. So here I am on the old treadmill again with my slide pictures showing all these dead fish. Well they sent two people from Washington to investigate this deal because it was very serious. I showed them the data and took them to the area. They wrote a report through the headquarters in Missoula that the findings they found were exactly as I had reported them. Serious damage had been

done to a national fishery. I believe one of them wound up studying jack rabbits in California and I don't know where the other one was sent.

There was only one other study that amounted to anything. That was in Canada and the effects of DDT. Next comes a subpoena from Brooklyn, New York. I was to testify in court on DDT. This was brought about because the Forest Service had a program trying to eradicate the gypsy moth, before they got into the Adirondacks. They were going to spray all the populations and the Roosevelts filed a suit. Here I am, being treated as royalty back there. I'll never forget when they put Hargraves on the stand. They asked him if he was familiar with the AMA. Dr. Hargraves looked at them and shook his papers and said, "I am the AMA."

I wound up really laying it on the line, what a beautiful place Montana was. This guy shook his fist at me and said, "Your Honor, this guy isn't testifying. He's making a speech." I looked at the Judge and said, "I didn't come 3,000 miles to listen to this." The whole audience started clapping. The Judge pounded his gavel. I told him to come to Montana and we'll go fishing. He said thank you very much. And I left. But I got \$50 a day plus some real fine meals and met an awful lot of real fine people. That was the extent of my work with DDT. Although we won the court case and the Forest Service did not spray anymore DDT to our knowledge – at least their fish mortalities were minimized when this program was over.

Opie, that probably didn't happen immediately in one year though. It took several years before they pulled out of the project. The Forest Service instituted a lot of safeguards; they had experts on wind that would sit in

the wooded area, and would call off the whole project if the wind was wrong because it could put the spray into the streams.

One time I flew above the spray planes at Rock Creek with Taylor Craft and when they'd get too close to the river, we'd get them on the CB. They'd be spraying one drainage and nothing would go into that drainage because of the wind; it would go up and over to the next drainage. The people who were most volatile about reducing the program were the people who were handling the fuel oil mixes. They needed a gallon of fuel oil to a certain amount of DDT.

Another problem I had was when we were inventorying streams in Bozeman with the shocker. The crew and I were going to run a population study on Miller Creek. We loaded all the equipment and I sent them up to get everything ready when I got a call from Perry Nelson in Billings to send the generator; we had an extra generator down there. I was going to get that crated and I thought no, I'll get this shocking over with. In those days our monthly reports needed to be in Helena by the 30th of the month, which made us anticipate what we would do the last few days of the month. My report said shocking this creek. Well, a snowstorm came up and there was no way I could get there and I knew the crew would pull out so I went back and crated up the generator and sent it to Perry in Billings. It wasn't long before I got the word to come to Helena. They gave me my two weeks' notice for falsifying records. I was dumbfounded. Eventually, an attorney in Bozeman contacted me and wanted to take my case and file a *writ mandamus* action because it was against the law for me to be discharged that way. It went to court and I was restored to my former job with all back pay, about \$2,400. I accepted a transfer to Kalispell.

Another project I worked on was a very intensive program on the native species -- the cutthroat and the Dolly Varden. The Creston Fish Hatchery, a federal fish hatchery, had dumped about 70 million rainbow into Flathead Lake. The creel census had turned up two fish and they were broodfish that had been put in Bigfork Bay. One of the problems was the Army engineers planned to open up or cut out the outlet of Flathead Lake so they could drain it faster. By law they could fluctuate approximately by about 10 feet a year. So I managed to get the Fish and Wildlife Service to do a creel census to establish the value of this Flathead fishery.

In addition to that I began to study the life history of the cutthroat and Dolly Varden and their areas and spawning success in the Bob Marshall. After considerable time, the Army engineers put aside their program for opening Flathead Lake outlets and the studies on the cutthroat and Dolly Varden progressed. There was no control over the fisheries for Dolly Varden and most of it was a snag fishery. By working with Law Enforcement Division several of these streams and smaller tributaries in the Flathead were closed to Dolly Varden fishing. It was very common to find huge Dolly Vardens with large snag hooks in them.

To back up a little, one day, word came through that we were to undertake a tremendous rehabilitation study and program on the Marias River, which was east of the Continental Divide in Nels Thoresen's region. We were all assembled in Helena and given an overall prospective of the plan. I got this out of sequence because the Marias started before I left Bozeman. At this meeting it was decided that I would fly the plane and we would do as much aerial reconnaissance as we could. So I left home and flew up to Cut Bank and we made a temporary barracks arrangement

out of the old Army hangers up there. Then the freightways trucks came in with truckloads of rotenone or "fish tox."

I remember that - it was much more effective than regular rotenone because it dissolved faster; at the time we didn't know what it contained.

We saw that we had a mortality in one place, it would stop for a section, and start again farther down, 30 miles below where the river meandered and slowed up, fish were dying. We finally realized -- those gray pellets in the bottom of the rotenone sack that we mashed up with our hands to get them better distributed in the water -- this was a surplus from Hercules powder manufacturing in San Francisco and it turned out to be toxaphene, one of the most violent fish toxicants around.

The Marias encompassed many miles of streams and swamps and sloughs from Glacier Park clear to the Tiber Dam on the Marias. I flew this area and my job was to follow a Whittaker duster that was rigged for low level dusting of rotenone products. I was loaded heavier in an airplane and I would have to fly and follow Loehoff and when he ran out of toxicant, I would land and we would load him up again. This turned out to be quite a project. I can remember one time we lost a bow on the wing of this duster and I was going to take it to Helena to get it fixed. We took some boards and clamps and patched the wing. So I'm flying down and I hit Wolf Creek and I proceeded up Wolf Creek and I saw quite a storm. I managed to see the Helena valley so I flew through the hole and got down into the valley. When I was landing in Helena my fabric was coming off my wing. I started to wonder if it was all worth it!

Marias was one project that required most of the Fisheries Division with some help from Law Enforcement walked most of the way on all the stream drainages that drained the east end of Glacier Park and the Tiber Dam site. Not once but several times during the summer. And all this with the barracks or tents.

We worked over 1,000 miles of stream; most of it was walked and most of the toxicants were backpacked in fire pumps and slugs filled with sacks whipping in the river. The Whittaker duster was the main form of application. It was a tremendous experience for me because I learned an awful lot about low level flying. I can remember many times coming down the canyon and seeing this line coming down and I would just barely miss a power line. Our chief pilot, Cooper, had rigged fish planting tanks in this Cessna. Vern Campbell of the Arlee Fish Hatchery had taken over most of the distribution problems. I remember the morning I had just landed in Cut Bank at a military airport where we walked out and heard a Cessna come over and it's making an awful banging noise. Sure enough, old Cooper landed it and got out and he was in tough shape. They'd gone down and hit this power line with the antenna on top of the Cessna and that had broken the line loose and it was banging into the rudder and the back of the airplane. When they came in we were trying to get them to take a cup of coffee and Cooper was shaking so bad he couldn't hold the coffee. I told him, sure too bad you didn't tell me you were coming and I'd drawn you a map with all the hazards in this country.

That plane was rigged for spraying liquid toxicants and we wanted to alter it for putting out our fish toxicant, by taking all the pipes and tanks out of the inside of his plane which left the hole. But then we had to increase

the airflow so it would suck the dust out. It didn't work.

I can remember we had the rear end loaded with sacks of rotenone with seven guys on board with shovels. So many of our remembrances still amaze me to this day.

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Clint Bishop

Clint was the second fisheries biologist hired by the Department of Fish and Game in 1947. This interview was conducted on April 19, 1994.

Clint, please start where you were born and grew up.

I'm a native Montanan, born at Havre. My Mother's family were real old timers as far as Montana was concerned. Her father was a blacksmith at Fort Benton in the early days; and when I say early days, I'm talking about 150 years ago. They were up there when it was the head of distribution for supplies that were shipped up the river to be transferred by wagon from there. My Dad came to Montana from Iowa. He and his brother were newspaper people and bought the Choteau Acantha and came out here. And then after they'd been here a couple of years, my Dad had the newspaper. He then met my Mother, I'm not sure where, but they were married and he bought the Shelby Promoter and operated the newspaper there for a period of time.

He must have given up on the Choteau Acantha and bought the other paper?

Yeah, he sold that. Then one year Dad operated Whetstone's paper in Cut Bank and it might have been while Whetstone was in the legislature, but he bought the Hill

County Democrat and we lived in Havre until my folks died in 1929. After that my Dad left enough money for the four of us children to get through school -- and when I say through school, I mean college. I was 12 when the folks died. They only took boys through the eighth grade at the Academy and then I was sent to Mount St. Charles here in Helena -- which is now Carroll College. I was in high school there at the time they changed the name.

Was your undergraduate degree in fish and wildlife?

Forestry, but I took as many wildlife classes as I could. I got my Bachelor's Degree before I was drafted into the service. I was first assigned to Custer's old outfit down in El Paso, Texas, Seventh Cavalry division. Then after a few years, I was sent to Fort Harrison in Montana. So, as far as I was concerned, I was coming home.

You went into the Army in Iowa and wound up back in Montana?

Yeah, I was drafted in Fort Lewis. And then I went overseas with the First Special Service Force after training.

How did you learn about the job?

Art Laney was a good friend of my Dad's and I contacted him to see about the possibility of getting back to Montana. Having my degree in Forestry, they indicated there were some job openings in the fish and game department. I made applications and I was the second fisheries biologist hired by the department. Chuck Phenicie was hired first, if I remember right, in June of '47. Then in September '47 I was hired.

Was your office in Helena?

The office was in Helena, in the Capitol Building. At the time Chuck and I started there were essentially no files other than the hatchery planting schedules on fisheries in the department. One of the first assignments Chuck gave me when we started was to prepare a file of the streams and lakes of the waters in Montana.

Tell us about your first accomplishments.

Well, the first thing I did was get the best maps I could find. Then I started up at the headwaters and listed them and worked my way, township, range and section – did that by drainage. After we had completed that, we wanted to get the information of the planting records. One of the first jobs I had was to go down to the basement of the Capitol building where the Fish and Game had storage rooms and locate the data on the plantings that had been made by the hatcheries. Then we entered them into the files that had been set up on the various waters. Then they decided we should get some creel census information on the waters and

so we set up creel census records for the wardens to keep and also for fisherman logs. Individual sportsmen would keep logs of their fishing successes on the various waters. We decided to enter the data on computers. I entered the file numbers we had for these waters in our master file. Then we mailed out these fisherman logs and the wardens creel census. They were returned to me and I coded them for the computers to become part of our master file.

In 1954, the only records we had in Missoula were the result of these warden creel census and the fisherman logs. What about your Master's?

Yes, in '49, I went back to get my Master's Degree in Fish and Wildlife management and finished in '51. I was allowed to go with the understanding that I still would handle the creel census information and the planting information and getting it into the proper order for the computers.

I think that was the first time we met, when your office was at the Mitchell Building.

Right, they reassigned us over to the Mitchell Building when the department started growing. They needed more space.

You must have gotten in on some field work with the shocking crews.

Well, I can remember the first old shocker we had. It weighed, it was an old shocker that we got that was heavy.

Was this the thing that Opheim had on wheels; he had one on bicycle wheels.

This was even before that. Chuck and I and some of the wardens worked on that first. One of the things we found in stream sampling and in creel census were a number of cases where the hatchery was planting one species of fish but none of those species were being caught. It enabled us to improve the chances for stocking to stock with the species that apparently were adapted to the waters we were putting them in. That was what the old five-year plan was supposed to accomplish but didn't. Prior to the five-year plan, fish were stocked by wherever the game warden, hatchery guy and local fisherman thought they should be stocked. The five-year plan put them in waters that were capable of sustaining trout, not necessarily the same species.

How about vehicles in those days? We didn't have four wheel drives.

I remember the first one I had, it was just a grey panel. Ford, I think, with a four-speed. Spent more time getting that thing dug out of mud holes than I did driving it. Then, when we got that four-wheel drive Suburban, that was quite an improvement. Chuck and I got around quite a bit to various parts of the state to get information. We did some preliminary work with that old shocker where we could get information on some of the waters. In formulating a fish stocking management policy you wanted to meet with sportsmen. A lot of my earlier work was just paper work getting those files set up.

You worked out of the Helena office until when?

'62, when I moved to Billings. I became fisheries manager down there. Laney Hanzel worked for me and Pat Marcuson worked for me for 16 years. I remember when Pat first started working in the high country, a few of the

supervisors in other districts would give me a bad time about using up somebody by working the mountain lakes. Pat loved that kind of work. I had help up there previously who didn't enjoy getting up in that type of country. When Pat completed the work, he wrote a management plan for the high country. Other supervisors said they wished they had information like that on their high waters. He was very thorough. He would go up in the winter to check what the fish were doing. Before he left for Canada, he wrote a book on the high lakes that's on sale.

Your high lakes survey was a major accomplishment?

Yes, I think so. And the Bureau of Reclamation constructing the Yellowtail Dam on the Bighorn was very interesting. One of the early things that we did on the Bighorn was to take a boat trip down through the Bighorn Canyon, down to where we passed through the dam site prior to the completion of the dam. What we were doing was trying to estimate what type of fish might be suitable for the reservoir when it was completed. We wanted to know what kind of bottom it had and what fish were in there.

It must have looked like a vertical bottom at that time.

One of the things we decided at that time was that it appeared to us it would best be suited to a walleye and lake trout. Those were the species that we introduced when they closed the reservoir. There also were brown trout present in the waters and we stocked some rainbow. They seemed to do real well and grew big. It has become a very popular fishery; that's probably fished as heavy as any waters in that region. Also one of the most spectacular.

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Robert Mitchell

Bob began with the Department of Fish and Game in 1947. This interview was conducted in 1994.

Bob, let's start with a little of your history.

I was born on July 21, 1913, at a homestead in eastern Montana; in a sod house -- I don't think there are too many Montanans left who have that distinction. My Dad and Mom homesteaded and did fine until one year in October the thrashing outfit pulled in to thrash and it was still sitting there the next spring because the night it came there was a snowstorm and it ruined their life's work.

It never got used the whole year?

No, they never got a crop. Dad was the railroad depot operator before that for the Great Northern at Brockton and he went back to railroading and I spent most of my early years in Paradise, Montana.

They didn't have a high school at Paradise so the school district paid us money to go to school someplace else. I ended up going to high school in Anaconda.

In 1947, I went hunting for a job. A friend of mine was running the fish hatchery at Anaconda and I went to see if he had anything. He put me to work the next day. It wasn't a very big operation -- had a manager, an assistant manager

and myself. That winter I learned how to take care of small fish, eggs, learned how to spawn. The process of getting a job with the department in those days was if you knew someone, you appeared and you got hired. You didn't fill out an application, or go through an interview process like you do today. The second day on the job the superintendent of Fisheries made a visit to the hatchery, which he had run for a good many years before he was superintendent. And, my boss introduced me to him and he looked at me and said, "He looks like he can work." That was the only recommendation I had.

I stayed there, well, I don't know if you call it lucky or unlucky, but I came to work the same time they started hiring fisheries biologists. I was with the hatchery system which was all old-timers all over the state. These hatchery biologists came in and they were a new breed of guys. They had an education in what they were supposed to be doing and we didn't. I could see these young guys had something on the ball. Then, in 1951, the federal aid money started. And then the biologists were hired and they could buy a new

vehicle, new equipment, where the hatcheries had been working for years on a shoestring trying to save money.

The first biologist you worked with in 1947 was one from the Forest Service, Ray West, who had been loaned to the department. The department didn't have a fish biologist then.

Ray West had a planting program that was a huge thing. They planted every water; they went by the map, any body of water they could see with a name they put a planting program on it. The hatcheries raised billions of fry and planted them in all directions. Sometimes when they got a sportsman's club or outfitter to plant them, they made a lot of mistakes.

I remember looking at those five-year plans when I first started and it seems to be the only criteria was that the water had to have trout in it. If it had trout in it, it got planted with trout. That's what they went by and some of them didn't even know if they had trout in them or not.

No, they had no way of knowing what trout was where. I went to Ovando we had a small fish hatchery in Ovando that just run part time. I went up there with a couple of truck loads of fish and got outfitters in the valley there to plant where they took their guests fishing. So, that was the way the planting was done. It went from no science on it at all to a good program that is workable and making a good fisheries for the people of Montana.

In the meantime, we had this feud going and we had a scuffle with the superintendent and he retired. They hired Walt Allen, who was a federal man. If they would have hired someone from the hatchery system or one of the biologists,

it would have just increased the war. He was in the middle and he did a good job with keeping the thing from blowing up and he made a good unit out of it. So, people got to working together a little bit. I think the first big project was the Marias River. It wasn't the best project in the world but it settled the hatchery and biologists into one unit, working together.

Do you want to describe some of the places you lived when you worked on the Marias?

Well, we lived in the Cut Bank airport. And they had a little concession stand there so we would take our morning and evening meals uptown and then we would pack a lunch for the rest of the tour. It wasn't desirable but we had a lot of fun and got a lot of work done. And finally, the biologists and hatchery folks worked together on that project.

Yeah, I enjoyed it. I was single at that time. I often wondered how you folks who were married kept up any relation with your families because you were stuck up there.

To give you a little idea on how it started, I got a phone call at the Anaconda Hatchery from Walt Allen and he said, "I want you to go up to the Marias project and help the guys get started up there." I said, "how long." "Oh," he said, "a couple weeks." This was in July and I got back in November and I was home once in that length of time.

Only one trip back?

One trip back. And I used to call my wife every Saturday night to make a collect phone call and I'd tell her, talk as long as you want, cause you're paying for it.

That project opened our eyes. This time the younger biologists got their eyes opened because they were working with a bunch of men who were older and knew how to work. They learned some things and we learned some things. I worked with you, Art and we were poisoning backwater off one of the drainages one day and we turned up more baby carp fry than I could raise at the Anaconda hatchery.

I remember you saying that day, "Good God, there's more fish here than I can raise all year."

Yes. It worked out good and I have been lucky. I have traveled this whole state of Montana and worked all over it and got in on several programs to begin with, like we started planting fish with airplanes instead of pack horses. Cliff Higgins, the pilot of the helicopter and myself developed the equipment that was used to survey mountain lakes. And that made for a good project for planting. And then they got to even planting fish with the helicopter.

Before you and Cliff developed that you were first able to plant fish by air and all of a sudden that allowed the people who wanted to plant fish to plant them faster than anybody could ever keep track and much more planting.

Much more than was needed. Much more than was needed in lots of cases. Cliff and I worked out the details of the helicopter that we could begin to keep up. And then we had the fish planting policy that said no mountain lake would be planted unless it had been surveyed. Finally put it on a basis where we were planting to produce something and not just planting because the water was there.

You had another airplane experience. This doesn't have to be in chronological order, we can back up from the Marias. But sometime before the Marias you had an experience with not only flying fish, but flying horses.

Well, Tommy Schurr and I had the job of finding some Montana cutthroat trout to start a broodstock in the hatchery system. And they flew us into the south fork of the Flathead, the Bob Marshall wilderness area, and we tried to find the source of spawn. But it was a very large area and we were afoot and we couldn't do anything. It kinda washed out and fell apart at the time, but Walt Allen didn't believe it would die there and the next year he called me in and wanted me to go back in and try to find some good spawning cutthroat. I said, "We can't do anything there afoot, it's too big a country. We got to have some horses in there." So, he said, "take in horses." The only way to get horses in there at that time was to teach them to snowshoe or to fly them in. "Well," he said, "we'll fly them in."

Is this because it was early in the year and the passes were full of snow and the horses wouldn't make it over?

That's right. There was no way to get in. So he called up Johnson Flying Service in Missoula and wanted to know if they could do it. We got a veterinary in Drummond to go up to the Boyd Ranch where they had a small airstrip. We had three horses we flew in. We anesthetized the horses and hog tied them and moved them by hand into the airplane and flew them in asleep. Drug them out at the airport and let them come to out there.

How many people does it take to lift a horse into an airplane?

About 8, all lifting hard.

I'll bet. And then when the horses came to after you unloaded them, did it take a long time, were they alright when they came to?

It was very interesting; two of the horses had been in that country. One of them belonged to a game warden and the other one belonged to Tommy Schurr. We unloaded the horses at Big Prairie ranger station and the third horse had been bought by the department from east of the mountains and didn't know what a mountain was. So when the first two horses began to come out of it, the veterinarian who was supervising that end of the project said, "Just rest them for a couple days, just turn them loose and don't use them for a couple days." Well, two old horses that had been in that country walked around the edge of the fence for two days and they'd stop and look and then would go walking again. Just as much as to say we know where we are but how the hell did we get here. And the other horse paid no attention, just went off to grazing.

One horse knew nothing and wasn't upset at all; two of the horses wondered how they got there.

Yeah, it was something. We worked on that project but it wasn't successful. Then the next project was to fish through the ice in the winter, use a plane for our transportation and fly the fish out. Well, we didn't have planes large enough to haul the fish and keep them in water, so I started experimenting at the Anaconda Hatchery with some adult fish we had there for display. Anesthetized them to see how long I could keep them packed in ice and then bring them back to life by putting them back in water. Oh, I kept them out for 12 hours.

Packed in ice?

Anesthetized with Seconal and they came out of it alright. We went in there, a crew of us with a couple of airplanes and stayed at the Big Prairie station for a couple of weeks and fished through the ice on Salmon Lake. We boxed the fish up and held the fish we caught with hook and line. Made a holding pen for them and got a bigger hole in the ice and put a cage down there to hold them. And then the pilot would fly them to the Arlee Hatchery packed in ice. Vern Campbell at the Hatchery was bringing them back to life and kept them there at his Hatchery. And that's how we got our first cutthroat.

That was the basis of the Hatchery's cutthroat broodstock?

Yeah.

What year was that? I thought it was around '51.

I think it was in the mid '50s. But I was in on all kinds of projects like that, because I didn't know how to say no. They were all interesting. I had done a little packing when I was a kid with horses and mules so anytime we had to go that way I ended up doing most of that.

And you did packing on your own into the South Fork after that?

Oh yes.

What are some other projects?

The next project we got into we decided we had to have a planting program so the Hatcheries could put the fish where they would do some good. Not just do it because we were getting pressure from sportsmen to plant their favorite

fishing hole. So, it was.. four or five of us who were on a committee to develop a planting program. The last few years I was in the department it was handled by two men, George Holton and myself. We would go from Hatchery to Hatchery and meet with the Hatchery people and the biologist who were responsible for the fishery in that area to get the right answers on what kind of fish to plant. Saved a lot of confusion. Bud Gaffney, the biologist from Bozeman, was against our program and I was against his and then one day at a meeting, somebody got up and said, "This is a milestone, Mitchell and Gaffney arguing on the same side."

So, I've been very fortunate. There was some undesirable time, being away from home a lot. One time they asked us how many nights we spent away from our station. So I went through the log book at the Hatchery for that year, and I'd slept away from home nine months out of the twelve. So, some of it wasn't good and I was lucky to have a good wife to keep things on an even keel.

Yes, we've all spent quite a bit of time away from home, but I agree with you, we were in when it was more fun than it is nowadays.

Yeah.

We're both fortunate we had a very good life, we saw an awful lot of Montana and hopefully we left it in better shape than we found it.

That's right.

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Nels Thoresen

Nels was the third fisheries biologist hired by the Department of Fish and Game in 1948. This interview was conducted on September 16, 1993.

Nels, where you were born and how did you decide on a career in fisheries?

I was born in Great Falls in 1920. We didn't live in Great Falls very long and I went to school in the country. I went to high school in Belt and graduated in 1938. I was in school at the University in Logan, Utah, and they had a newly formed fisheries section there, along with the wildlife school and the school of Forestry. I worked for a short time during the summer for the Utah Department of Fish and Game.

How did you happen to go to work for Montana?

Well, they wanted to know more about farm ponds in the state; they were getting a lot of inquiries about problems developing in farm ponds -- fish kills and things like that. There was an opening for a two-year study of farm pond conditions. I worked with Dr. C. J. D. Brown at Montana State University in Bozeman. I started doing field work on a statewide basis, trying to run down farm pond conditions,

physical, chemical and biological so we could know a little bit more about that resource. I was hired by the Montana state Department of Fish and Game.

How many other fisheries biologists were working there when you went to work?

Just two. Chuck Phenicie headed up fisheries and Clint Bishop was working in Helena. That's all.

You were the third one, then.

Right. There was a crew of men working on Prickly Pear Creek, mostly on studies that were directed by MSU and Frank Stefanich worked on Prickly Pear for a while before he became a biologist for the state.

Well, I believe in '51 you had just finished this survey of the physical, chemical characteristics of farm ponds and were at that time going to be headquartered at Belt as a district biologist.

That's right. We were spread out so thin we didn't have enough people to concentrate very much on the overall conditions for fisheries in the state so it didn't really matter where I headquartered; I mostly worked out of Bozeman on the farm pond study. I'd be gone from Bozeman for a month checking up on a series of ponds I was working on statewide.

What year did you start with Montana?

'48. One of my first memories was to get some northern pike for my district and there was a crew shocking up on the Sun River. The crew from Helena was running the shocking. I think we shocked a tunnel, didn't we? It was a fish supply canal. There was a Sun River Irrigation Project that takes off from Sun River and flows down into Pishkun Reservoir. The lake along the canal was formed by leakage from the supply canal and it had been planted with northern pike. There was no record of that plant, but it was a source of eggs for us.

The first shocking operation was in that tunnel at the base of Gibson Dam and I can truthfully say I saw the inside of the east front before I ever saw the outside.

When they shut the supply canal off the fall of the year, there was a lot of fish stranded in the low places where the water couldn't drain out. We shocked that to make a determination of the extent of fish that were left in the supply canal when it was drained.

Well, one of the largest projects was the Marias.

We knew that Tiber Dam was going to close off and impound the Marias and that summer, and because there was so many carp and other rough fish up in that drainage, we

were trying to get ahead of the carp. We decided to kill that carp off to keep Tiber from getting a good start with carp as soon as it was closed. We covered a lot of miles. We found carp as far as up as Cut Bank Creek as far north and west as Browning.

We all thought we were using powdered cube root or derris root that wasn't harmful to anything but animals who breathe with gills. Then we found out that this stuff had toxaphene in it and we'd already started down the drainage. Did you worry a bit when we were headed for the water supply intake of Cut Bank which was the Governor's home town at that time?

I surely did. We made arrangements to go through there at a time when they weren't pumping but we knew that the material we were putting in the stream was going to enter that water supply. What we didn't know was that there was toxaphene in that product.

It [toxaphene] was in all our trucks. In fact, I can remember bags of it piled up in the truck I was sleeping in a time or two.

Yes, and besides the trucks we had the Cut Bank airport and there was a hangar there that they didn't have any airplanes in so most of us slept in that hangar, and worked out from there. Later on we were working further south and part of the crew was just camping out and working days. The carp were resistant; the other species of fish were easier to kill than carp, we had to hit them pretty hard to make sure we killed them all. Surely we reduced the population by a whole lot by the time Tiber Dam was closed.

How about goldeye? Were you successful with goldeye?

Goldeye were one of the easiest to hit. When we put some toxicant in the stream, as soon as it started downstream, goldeye started turning up and by the time we worked the stretch of river or stream, goldeye were all gone. There was a little sucker that seemed to be a good indicator of how effective we were and we'd watch for them and as soon as we found them, we'd reslug the stream and work on down from that.

What were some of the problems you remember.

Vehicles were a problem. We were dealing with some pretty long distances and if we were going to be effective we had to have vehicles and that took more than we had on hand. We had vehicles from the Hatchery and spare vehicles from Helena. It was hard to have supplies in vehicles at the places where we were working. To do our work at the right spots on the water, we went into every possible place where we could find carp, even some of the smaller streams. Any backwater or anything, there'd be carp in there. Lake Frances, somehow, was devoid of carp, although there were carp practically right at the intake canal that fed Lake Frances. And I don't know that we were so lucky that we didn't have carp in Lake Frances because that's a good sized body of water and it would have been a lot more difficult to see that they were killed in Lake Frances.

And it's carp-free today?

Yes, Lake Frances is a pike fishery now but back in the days before this project, why we had kokanee in there and rainbow trout and it didn't have the carp problem. Lake Frances had a lot of shallow areas that carp would have really

muddied up and been a detriment to that fishery. Lake Frances has been a very good fishery throughout the years.

What about Kipp Lake?

We found that Kipp Lake and a few other bodies of water along the Great Northern Railway were saturated with carp. They built these reservoirs, the water intakes for the steam locomotives they were running. Kipp Lake was a fair body of water and it was completely filled with carp; some of the sportsmen in the area went to Pike Lake and got some northern pike to put into Kipp Lake to try and control the carp population in there. They weren't contributing to any kind of a real decent sort of fishery but they were present and then we killed Kipp Lake as the first step in this Tiber project. We didn't know exactly how to go about it.

We had such a short interval of time every morning to put the toxicant into the lake because the wind would come up and blow us off the lake by 10:00 so in order to do the job in a relatively short time, we decided to do it with airplanes. Since there weren't many dusters in the area, lots of spray planes, but no dusters, we made arrangements with a flying service in Choteau to modify one of their planes, one of their Ford tri-motors to put the toxicant into the lake and get that job done in a relatively short time. We made a crude modification, a hole in the bottom of the plane, and mounted the 55-gallon barrel over the top of the hole. Different crews would take turns flying and running the toxicant through the barrel. We had the hole lined up with the hole in the bottom of the barrel and each pass over the lake we could put enough through to cover a good swath.

I remember a piece of stovepipe fit the hole in the bottom so you could shut it off and then somebody

would pour the barrel full except for that stovepipe. When the airplane completed its turn and it was over the water, the pilot would signal and the guy over the barrel would pull that up and hope that the toxaphene went out.

It was fairly successful, a rather crude arrangement, but it worked and we got a complete kill on Kipp Lake which was sort of a challenge because there was so much carp in that lake it was necessary to cover the shallow water areas. The skunks came along following our kill and there's caves around the dam with dead fish.

It must have been rather unpleasant for the locals around there then.

Well, fortunately, there wasn't anyone who lived real close to Kipp Lake.

So that was a complete kill. We were lucky there wasn't any harm to the crew. Once in a while the toxaphene would blow back into the airplane. I can remember having a pretty good mouthful and face full of that dust a time or two.

Well, we were pretty lucky a lot of times when we were putting that material out. Cause as you mentioned before, it wasn't just rotenone in that product and handling toxaphene. When we were handling toxaphene in liquid form we took great precaution not to expose the people who were doing it.

Rubber gloves, face masks working with liquid toxaphene.

And here we were using this "fish tox," fortunately we didn't harm any people. If there'd been an EPA back then

we wouldn't have spent five minutes on that method of application and they'd just shut us down.

I'm sure, Nels, if there'd been an EPA, an OSHA, or an employee's union at that time, that job would never have been done.

That's true.

So part of the Marias job was poisoning, but part of the job was planting?

Yeah. We planted rainbow trout pretty heavily in the drainage in the following year. One thing working with flowing water the toxicant didn't persist over the winter; it cleaned itself out relatively fast. Some other projects in the area the toxaphene persisted throughout the winter and into the spring.

Did you replant some of the Marias that same summer?

That's right. Some of the crews got ahead of themselves and we ended up killing some of the fish that were just being planted. Someone asked what all these people were doing up there and I told them, "Well, some of them are planting and some of them are unplanting, but they're all keeping busy."

Let's back up to when you first went to work for Montana. You mentioned getting on a farm pond study. How did you apply for the job?

Well, it was a cooperative job; MSU in Bozeman was getting a lot of inquiries about conditions in farm ponds and if a farm pond killed out, they'd inquiry as to why it happened, why did it kill out. We needed information on why the condition was out there in these ponds throughout

the state. So Chuck Phenicie, the state fisheries biologist (the first one they hired) was faced with the same kind of questions. They decided they needed a project to determine what the condition was in these ponds throughout the state. There was a job opening and I was looking for a job. I'd just completed the requirements for a Master's Degree. We learned by the grapevine I guess that this project was being set up.

What kind of equipment did you have?

Well, the most important thing I had was a chemical kit that I could determine oxygen and alkaline and things like that. I didn't have much of a boat. I had a war surplus rubber life raft; I was assigned a vehicle. Archie O'Claire was the director and the state game warden at that time. When I reported for work he gave me the keys to this vehicle and we went out and looked at it. It was a Ford panel truck with a three-speed transmission in it; it would go down the road like a scalded cat but it wouldn't pull up the smallest hill. That was my vehicle that I covered most all the counties in Montana.

And you weren't just driving it down the highway, you were going on back roads, gumbo roads; uphill, downhill.

We had to put on chains a lot of the time; I got it in 1951. It had lots of power for going down the flat road, you could put it in second gear at 55 miles an hour with no trouble at all, but sometimes you had to get up the hill.

I concentrated on ponds in Phillips Valley area -- during the early '30s, they built a lot of ponds and reservoirs to water cattle in those counties. They moved people off the farms, or off the places that were scattered all over the

southern parts of those counties and they moved in along the Milk River to make that an open range condition where they'd summer their cattle and bring them into the Milk River bottoms during the winter, but it made a good place to plant fish. Fish were planted in a lot of these resettlement reservoirs and the records of planting weren't all that great. There was a couple of fellows that lived in Malta that were kinda in the fish planing business. They'd seine some fish out of an area, put them in cans and stuff and take and plant these ponds; some of them took off wonderfully well but others didn't; then there was fish coming out of Miles City, mainly bass and bluegill. So when I come along, I got a hold of some records from Miles City and then from department people in Malta I'd find out what reservoirs had been planted and I'd go there and check the reservoirs. I'd check the alkalinity in the water and the oxygen and so forth. And I'd put out some gill nets and get some idea of how well the fish had done, whether or not they were still in the reservoir or had died out.

You had to use a war-surplus river boat to do gill-net setting. Most of the folks today are used to rubber boats that are used on rivers with wooden bottoms or inflatable bottoms. How did your chemicals set on the floor of that boat?

Very precariously. I would get out and take a sample and sit there in that boat and try and run those tests. Scatter out some of the chemicals that I had sitting there bobbing around in that boat and trying to run these tests.

One of those chemicals as I remember was concentrated sulfuric acid and the bottom of that boat was not much more than a couple of 1/16 of an inch of



plastic. Did you ever think what would happen if that bottle of concentrated CO₂ fell over in the bottom of your boat?

Well, there was one of the chemicals that was pretty strong. I remember once I was sitting there and a gust of wind come up and I got it into my mouth and it took the skin off the top of my tongue and I took a piece of cheesecloth that I had there and tried to wipe it off my tongue and it did away with the cheesecloth.

One of the things you want to do with a gill net to make it work right is set it in a straight line – straight and fairly tight. And one thing a rubber boat will not do, particularly in the wind, is go in a straight line. I set a lot of gill nets that weren't stretched out as taut as they should be. I was mainly trying to see if there was any fish in there, the sizes to determine if the plant was successful and that the pond wasn't devoid of fish.

Can you think of any other reminiscences ?

When we conducted this farm pond survey over a few years and gathered enough information so we generally knew a little bit more about what the conditions were in these farm ponds, we come up with some figures of what the physical features of a pond was going to have in order to sustain fish. Then Dr. Brown and I started writing bulletins that included the information we had gathered.

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Laney Hanzel

Laney began with the Department of Fish and Game in the summer of 1952. This interview was conducted on April 20, 1995.

Laney, let's start with where you grew up.

I'm a native Montanan, born in Belt, about 20 miles east of Great Falls. We lived right next to Belt Creek so I became familiar with life around the stream. I always wondered now, looking back, how my Mother let my brother and I loose as much as she did along a river. My Dad always fished a lot and we enjoyed going to small streams. One day I saw a man with a bunch of bottles in a boat rowing around and taking samples. My friend and I were curious and wanted to find out what was happening. It was Nels Thoresen, one of the biologists with the state and he was trying to see how to raise fish in this farm pond. And, from that day on my goal was to become a fisheries biologist.

The next summer I started working as a field helper with Nels while I was still in high school. I just turned 16 so it was an opportunity for me. It was probably an earlier start than most people get with training. The biologist field was just barely new to the state, starting around 1950.

What about the data you found during your first years?

Dr. C. J. D. Brown was my professor at MSU in graduate school and I did a study on the distribution of the westslope cutthroat, because it was a species of fish that nobody knew much about and the numbers were slowly diminishing. I visited most of the cutthroat waters in the state to collect and measure fish. I was Dr. Brown's assistant

in some of his labs with limnology and fisheries work. Dr. C. J. D. Brown was also associated with (AFS) the American Fisheries Society, and was very active in it. In the years I was at Bozeman we were able to go to three AFS meetings.

What were some of the projects you worked on?

While in Kalispell I worked on a project to find out the movements of the migratory cutthroats from Flathead Lake into the Flathead River system. We had to cover 180 miles of river. And in another project we had to float in all the areas of the upper Flathead -- the Bob Marshall, Glacier National Park, Canada and all the way down to Flathead Lake. It was very valuable to see what was happening and what was going on. I also took some aerial photography for the department and have quite a collection of pictures.

Some of the first intensive work on Flathead Lake was conducted by the University at Yellow Bay during the summer. Nothing had been done during the winter so all this was new ground. One of the first things we ran into when Dr. Brown came up to assist us and set up our sampling program was the pygmy whitefish. Although we have them up here in the area they had not been found in Flathead Lake. We set some small mesh gill nets and we got about 100 fish, much to Dr. Brown's surprise. He liked them because he could take some back and use them as samples in his fish lab. Every net we set we didn't know

what we would find. There are 22 different kinds of fish in Flathead Lake ranging in size from the pygmy whitefish from 2" - 3" inches up to the large lake trout, with a 42-pound fish being the state record.

Bud Mead was my first captain, a carpenter by trade and helped me maintain the boat. It took about a month and a half in the spring to get it ready for the water. It had been out on the coast and was in water all the time, so it didn't dry out. But here in Montana, we couldn't leave it in the lake. This caused a few problems that I didn't anticipate at that time. When you take a boat out, it dries out and when the caulking inside is a wooden strip, everything leaks. This boat was a 16-ton boat and it had two-ton of concrete in the fish hold for ballast so it was a very stable boat.

I used that boat on the lake for 16 years. A 32-foot boat is a good sized boat for the ocean; its primarily the size of the wake and the wave in relation to Flathead Lake. A 26-foot boat is better for Flathead Lake because you can fit in between the troughs of the larger waves. The 32-foot would life you up and throw you around a lot more because of the inland waters and the shape of the waves. As far as the waves, we knew there was a five-wave frequency. If you turned around and couldn't get back into 3/4 position by the end of the fifth wave, you knew it was going to be rough out there.

We knew that the lake was historically a kokanee lake, and that kokanee was an introduced fish, so we needed to know more about them. The gill netting did not tell us much about kokanee because this fish is an open water fish so we had to learn to sample in the open water. Sounding or acoustics was just beginning to be used. We got the latest sounder from Seattle and worked with the applied physics lab and the Ross recording system. We got some real good

information on the populations. Once we saw these fish in the open waters we wanted to see what was happening. We developed a new purse seine, an inland purse seine; a net 600-foot-long, 60-foot-deep. This was one of the first inland purse seining operations and we could utilize the net to collect kokanee in open areas.

Before the sounder, if you couldn't see fish you could spend a lot of time; it took us about an hour and a half to make a set and you'd come up with one or two fish. When we finally got into the areas where there were fish, I remember one time anywhere from 8,000 to 12,000 were caught with this inland purse seine. We were gathering a lot of information and collecting a lot of data. We have about 25 years of data on the computers and its all retrievable.

What did you work on after your seining experience?

Once we got through the seining, we started working with hydro acoustics. We were recording the acoustic data that we were seeing on the charts on the boat and putting that on magnetic tape, run it through a computer and it could actually calculate the volume and density and come up with concentration of fish per acre. This was really what we wanted to do. We were able to have one of the original hydro acoustics systems on the inland waters on Flathead Lake. One thing about gathering data, particularly with kokanee, you have to work all at night. Flathead Lake can be a challenge during the daytime, but turn the lights out, and it's even more of a challenge. The kokanee are near the surface and as they draw deeper in the water column you have, the acoustic cone is wider at greater depths. As it goes down you have a better chance of picking these fish up and see what's going on. Now, the new sophisticated acoustic gear allow you to get the numbers regardless. The original

data we were collecting on cassette tapes and being able to monitor through an oscilloscope, we had to monitor the sizes. We would replay the tapes and count the data back. It was sure fun getting it and you just went out there to listen to these clicks -- two pings per second, click, click, click for about four hours. What it took on Flathead Lake to get a good sample was to cover 90 miles of the lake which took about five or six nights, about four hours at a time. We collected probably close to 16 hours of tapes. We wanted to determine densities of fish at different intervals so we had to run it at least three, four or five times. We did this for 16 years with the one boat.

Scott Rumsey was the first mate and one time he asked me why we couldn't put the board back on the fish hole. What we found out was this pipe, he knew was the gas tank, was fixed on the bottom and the keel was starting to get soft and the gas pipe, a 3/4-inch pipe was being pushed up to the top. The wood was becoming rotten. We had a surveyor come out from Seattle and said the boat was unsafe. Needless to say with all the experiences and all the rough water I did not want to go out on it again. We sold the boat but I hated to see it go -- it had a characteristic of its own. It was called the Dolly Varden and was quite a boat. So we needed to buy another boat. We designed a boat here and presented it to marine engineers and they came up with a design for a new aluminum boat, a 26-foot boat with the gear that we wanted. So I went to purchasing and said, "We want to come up with some specifics for the boat." I had specifications for a boat that had been built out on the coast. It went out for bid and the guy that got it only bid \$50 less than the other guy.

Only \$50 less?

It was about \$45,000. I said, "No way do we want this boat." For two years we were without a boat. Finally the guy built the boat. It is a good boat because we had a good design. If we'd had a boat on the lake we would have known of the salmon collapse a year or two earlier.

We were seeing adults but the young fish were just going out. We would have had a better inclination of what was happening at that time. But we did get a new 26-foot aluminum boat, a planing hull, could move a lot faster; the other boat would only go about 16 miles per hour, but it took a long time. This newer boat would cruise about 30 miles an hour.

Once we got that boat, we started to fix it for the acoustic equipment we wanted. This included a GPS locator, small radar and the latest digital hydro acoustic gear we could get. Right before I retired, about a year after I retired, I retired in January of 1993 and at that time I was able to spend one sampling period with the GPS and the radar. These items really made an improvement as to the type and whereabouts and even the safety on the lake.

We were finally able to buy a computer and convinced the University of Montana to buy a processing board because they were going to use the data. Now we have a complete system, probably about \$125,000 worth equipment, including the computer that will analyze these digital tapes that we have on the lake. By having a computer on board with this processor will allow you to instantly see the numbers of fish by depth interval and sizes. We're capable of looking at fish from one-half inch up to the large lake trout.

You're not listening to clicks anymore?

We can turn them up but we don't have to listen to them. It also analyzes a dual beam system where you send down two impulses, listen with another one and measure the difference. It allows you to distinguish sizes and where that fish is within the transit signal. So you can compare the sizes of the return signals and you can define the size of a fish and count them. The computer program automatically calculates volumes and you only need to write up what's there. That was one of my sad things is I'd worked for 15 to 20 years to get a system that is applicable to Flathead Lake, and then I leave. Fortunately, the state has been putting me on contract and I'm doing some of the work that we did in the last phases. Part of the reason we'd been looking at a computer is we had to spend \$300 an hour to have the tape analyzed. Once you have a computer and processor, it will do it by itself. We were also using trawls with otter boards and we also went to fixed frames where we could sample the fish species. The sounder will tell you the size of the signals and the number but won't tell you what kind. With 22 kinds of fish you really don't know what you're looking at and you have to verify the fish.

I can go on and tell about experiences on the lake. Lightning was one thing that you always have a problem with on the water. When you're on a particularly large boat, in the middle of 126,000 acres you know you aren't going to get to shore and lightning storms come on, what are you going to do? We were collecting some acoustic data at night, moving up the middle of the lake when a lightning storm came abruptly from the south, moving very fast. A lot faster than we were; we usually traveled about four to five miles per hour. This storm was traveling at least 25 or something like that and it was moving very fast. We were counting lightning every 10 seconds and they were coming down and hitting all

around us. Fortunately, we got away from it and it passed over the top and then we went out and finished our work.

Lightning strikes were hitting the water around you?

Yes. The only time I felt the experience was on my own sailboat. A storm approached and everybody's hair stuck out with static electricity and if you touched anything with metal you could feel electricity. In the spring you had to wait for a month to put it into the water until you got it ready and then it had to be soaked up. We put the boat in many times when we had two pumps running to keep the water until the boat soaked up and then it wouldn't leak at all. The first two weeks we had to sleep on the boat a few nights to make sure the pumps didn't fail. I guess we can talk about freezing. I'd like to mention some of the folks I worked with; people who assisted me. Starting out with Walt Allen, the first chief of fisheries; Chuck Phenicie, Boyd Opheim, Frank Stefanich, Art Whitney, these are all old timers; Nels Thoresen, George Holton. I don't want to leave the newer ones out but these old fellows really set the basis of what's going on in the state and I appreciate the time with them. I still enjoy a beer with these fellows. We don't have to drink as much anymore. I remember one trip with Opheim we were going to a great plains fisheries meeting. We drank more beer on the way over than we used gasoline. Then we finally met the Canadians and things really started. We went to a lot of meetings, I had a lot of good times with the fish and game.

If you had to do it all over again, would you pick the same career?

If I had the same experiences, but if I had to start today, I don't know.

We had the best of all possible worlds. I've talked to some of the younger folks today that say the same thing – we had all the fun and I agree with them.

I agree with them too. And I'm enjoying retirement too; not missing those nighttimes out on the lake. That's no fun. I guess in the last four or five-years I've spent less time on Flathead Lake and more time dealing with environmental issues on the Flathead River and Flathead Lake. Regarding docks, projects and things that might affect fisheries. Where I really felt we made some progress, they were building a road up on the north fork and they built an area around what they call Hell Roaring Creek. It's a very steep area and they put the road in. At that time we heard the engineers say that it was a federal highway, they knew they were going to have problems with this area but they'd made enough concessions to conservation that the only thing they thought they could do was move the road away from the river. So after about ten years we were experiencing problems of heavy sediment coming down during the early spring runoff over the top of the snow and coming off the bank that was cut that was too steep and running down along the road and right into the culvert and into the river. It was coloring water down below. We sampled the water at one time and found out that about 16 10-cubic yard trucks were going into the Flathead a year. Just by sampling the concentrations. Using this type of information, through a lot of coordination with the county and Forest Service, we convinced the federal highway department to go to that area and spend \$1.5 million to avoid the circumstance that would rectify the problems of silt. I really think it showed a coordination between a lot of agencies and things could really be done right.

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John (Bud) Gaffney

Bud started working for the Department of Fish and Game in 1954. This interview was conducted on September 29, 1993.

Bud, tell us about your early history?

Well, I grew up in eastern South Dakota on a small farm. My parents operated the farm during the 1920s and '30s which were commonly known in that country as the "dirty '30s." My interest in fish and wildlife goes back to those early years. A neighbor of ours on an adjoining farm subscribed to several outdoor magazines and he always brought them over for me to read. I didn't realize you could make a living managing fish and wildlife. It was pretty enlightening for a small boy on a dry-land farm to read about hunting and fishing trips all over the country.

This was after your career in the Navy?

That's right, in the late '40s. When I was in high school we didn't think about a career. Career choices were rather limited at that time and being able to find a job that would provide a living was higher on your priority list than selecting a career. But then I read about schools around the country that were offering training in fish and wildlife and wildlife technology. The University of Montana at Missoula listed two options -- one was a Forestry option. You could get a

degree in Forestry with a Wildlife option or they also offered courses in the Zoology department that they called Wildlife technology. I thought Montana would be a pretty nice place to live after living in the flatlands most of my life and that the mountains would be pretty attractive. So I applied to the University (UM) and graduated in 1952. Then I applied to graduate school in Bozeman. Dr. Brown was the fisheries professor at that time and Dr. Quimby was in charge of the wildlife aspect. I worked under Dr. Brown for two years in graduate school. I enjoyed living in Montana so I decided if employment was available I would like to join the department after I got out of school. As I recall the application and employment process was not highly structured at that time. I phoned Chuck Phenicie who was the chief fishery biologist at that time to see what the employment prospects would be. He invited me to come in for an interview, I guess it was more of a visit. Chuck indicated that he intended to add a number of biologists to his staff over the next few years. I don't recall exactly who was working where then in 1954. I believe you were in Missoula at that time. Nels was in Great Falls, Opie was in

Bozeman, Frank Stefanich was in Kalispell. Chuck's intention was to get additional people to help each of these fellows in their district. However, at that time he didn't have any openings.

Clint Bishop was starting a survey of fishery resources on public lands and they wanted someone to help with that project for a year. Chuck offered me the job so when I finished school in June 1954 I started working with the department. I went to Helena for my first day of work and that same day Frank Stefanich called down from Kalispell and wanted someone to come up and help him collect spawning cutthroat below the road culverts on the road that went around Hungry Horse Reservoir. That was a pretty interesting first assignment. We were only there a few days but it was impressive to see some of those fish that were running up being blocked by the culverts on that highway.

We traveled around the state and looked at the waters that were on public lands and made notes as to the fishery values in those waters. The department had an agreement with the State Land Board and also some federal agencies that any lands that contained water and were important to the fishery of the state would be withheld from sale – they would never be sold.

Other interesting things about those early days I remember about a week or two after I went to work Clint and I needed an extra vehicle for traveling around on this project. Nels Thoresen happened to be in Helena that day. There was an old truck at the Great Falls Hatchery that wasn't being used and Chuck thought I should go up and get the truck and bring it back for summer use. Nels and I left Helena about five o'clock and by the time we got to the Hatchery in Great Falls it was well into the night. I don't remember the reason but for some reason I wanted to get

back to Helena that night. We headed down the highway to return to Helena. Near the entrance to the canyon [Wolf Creek] the battery fell out of the truck. This was on the old highway. When I heard it hit the pavement I knew there was no way we were going to go anywhere that night. I pulled the truck off in the ditch and slept on the seat until daylight and hitched a ride back to Helena. Had to get another battery and vehicle and go back and get the truck. It got us through the summer, barely, but it did.

I can remember the vehicle. It left something to be desired.

Helpless and hopeless might describe the vehicles we had on that project. But we got through the summer. I do recall helping you with a number of projects in the Ovando-Lincoln area that summer.

I remember helping you guys move to Great Falls. It wasn't the condition of your truck but someone forgot to bring the maps. One of the vehicles had to go back to Helena. I offered mine to help move the two trailer houses. I pulled one of them to Great Falls.

Yeah, we had a truck full of maps and had all kinds of problems keeping them straight that summer. We got through the summer and hopefully some waters that might have gone into private ownership were kept in public ownership as a result of our efforts. Another thing I remember about those early years are the boats and the motors we used. You were on the Marias that summer and I was on the lower Clark Fork. We had some money from Washington Water and Power Co. and Chuck felt I should stay on that project since we were using outside money for it. I didn't spend that much time on the Marias. I needed a

boat and a motor so you loaned me your 18-horse motor for the summer. I believe it was a lone star boat you had. That was a pretty big motor in those days. Now that would probably be a trolling motor in most of our boats. We've got much better equipment now.

Have you noted any of the present boats they're using on Canyon Ferry? Inboard, outboard jets.

Boats became a sore spot at times in the department with the administrators. I remember one director was a little concerned about the number of boats that the Fisheries Division had. I don't recall if you asked us to do this Art or if we did it on our own. I got to looking around Region 3 and we had a little over two boats per person at that time. That wasn't quite as bad as it sounds because we were down on staff and we had two or three old boats around that weren't safe to use. We couldn't dispose of them so they were still on our property list.

That was the problem I had explaining to the director that some of them were almost unserviceable but sometimes were what you needed to get into small places and not worry about banging up equipment.

Yes, and a lot of those boats were pretty specialized. When we got into electrofishing projects in Region 3 we used the small 13' Boston whalers. By the time we equipped them for electrofishing they weren't usable for anything else. We couldn't put a motor on them and go out and gill net. It was a very specialized piece of gear. Another interesting item along the equipment line was our infamous pirate traps we used for a while. You recall that it was a monstrous trap that we used to get fish that were moving along the shore line. We did set it in some slack water on reservoirs where

we had a little current. It was difficult to set, as I'm sure you remember.

I was helping you and Frank; didn't we set it up in the Hatchery yard so we could see how it was supposed to look and we caught the dog in it.

Yes, we were able to release the dog. Another interesting item on the pirate trap, you recall it had a long lead on the main part that led onto the pod and there was a long rope attached to that with an anchor on the other end. The anchor was permanently attached so we didn't have a free end of rope to take up slack when we needed. When I was in the navy I learned a variety of knots that probably had some significance back in the old sailing days. One of them was a square knotted sheep shank that was designed primarily to take up slack in a line. We were setting this pirate trap in the Flathead River and when we tried to anchor the lead up on the shore we were faced with an eight-foot vertical bank and no way to get up there. The only way to anchor that lead properly was to get some slack out of that line. Frank Stefanich was amazed when I tied a square knotted sheep shank about 8' long to use up the extra rope.

It served a purpose.

Yes, that was the only time in my life I've ever been able to utilize a square knotted sheep shank to advantage. Some of the other problems we had in those earlier years were the distances involved in Montana. Everything was a long ways away and especially that first summer when Clint and I were on that land survey. We worked ten days on and four off. We worked the last five days of the week and then take four days off and go back for another ten. That minimized travel a little bit. It wasn't so difficult for the

employee but it was difficult for family. We had two daughters at the time and it was difficult for everyone to have the family separated that way. But it was a requirement of the job and we had to do it.

I guess one of the problems in those early years was one of attitudes -- both internal and with the public. Biological management of the fish and wildlife resource was not well accepted. I guess it still isn't completely accepted but we've gained considerable ground since that time. It was difficult to overcome some of the long established practices in fish and wildlife management that may have been less than sound from a biological standpoint. Attempts to change that were difficult. It often created hard feelings among employees from different divisions in the department; certainly with a lot of the public who felt that the old way of doing things was the best and we should continue to do them that way.

You had a real good point there. It wasn't just the public but internally too. There were folks that had been managing the resource one way and then we came along and thought it was ineffective. Then, too, we were just starting out with D-J [Dingell-Johnson Act] funding and money was easy for us compared to what the Hatchery crews had.

After that point fish and wildlife management had been primarily Law Enforcement and Hatchery operations. Not just fish hatcheries but game farms where game birds were raised. It was a transition period where people had difficulty in accepting new ideas. In many cases it led to hard feelings and problems on a personal level that may have been unavoidable. Fortunately, over the years we got by most of those things. Feelings are a lot better in recent years.

Another vivid memory in my mind is the process of moving families around. Reassignments were fairly common; it was necessary to move from one community to another. At that time the department had a snub-nosed truck, with a large stock rack on it and that was the moving equipment. When you were being reassigned to a new area you would borrow the truck for a few days and get some of your fellow employees and neighbors to help load some of the furniture and cover it up with a tarp as best you could and head for your new home. I guess it's to the credit of wives and families that they survived those moves. Like anything else we made the best of it. And I don't recall when that change in policy came about; it was probably in the '60s when the department decided to move people by professional moving companies when they were reassigned. It probably took the pressure off the family when they were moving to a new area.

In those early years, we were spread thin around the state and didn't have full staff in any area, so it was necessary to help each other out. I'm sure you'll remember when you and Frank Stefanich and I used to net the Thompson Lakes in the winter. That probably wasn't a major milestone in fisheries management in Montana but I always remember you pulling fish out of the gill nets bare-handed in sub-zero weather. I wore gloves and my hands were still cold working with those gill nets.

As I remember both Frank and I had recently invested in felt-lined boots and fleece-lined overshoes that kept our feet warmer.

That was pre-Sorrel days. Now we've got Sorrels to keep our feet warm.

That's one of the things that I remember about those early days, too.

Yeah, we got to know people and help them out. I did work on that survey on the Lower Clark Fork. It was a cooperative project with Washington Water and Power Co. I remember when the budget was prepared for that project it included a small trailer house that was used for an office and a field station. I still remember it was 8' wide and 22' long with one bedroom with two single beds in the back and a bathroom; and a living and kitchen area. I was kind of amused; one of the administrators from Helena came through the Kalispell office one time and I was out doing something, getting prepared to move the trailer house. He came by and looked at the trailer house and I had the feeling that something was worrying him. I asked him what he thought of the trailer house. He said, "Well, I guess it's alright. But it hasn't been our practice to furnish living quarters for employees' families." I couldn't wait to get home to tell my wife and she and I and the two girls were going to move into an 8' by 22' trailer house for the next two years. That wasn't the purpose of it. It was a nice trailer house and it served well for a field station but it certainly wasn't suitable for a family to move into.

One of the problems we had in those early years was stream alteration -- both the streambank and the streambed. There were a variety of reasons to alter streams in those years. Farmers and ranchers wanted to keep the stream from running where they didn't want it to go. We went on a lot of inspections in those years with individuals and agencies to discuss the effects of that type of work on fisheries values, but actually fisheries values got very little consideration in the final design of the project. It was pretty frustrating to me to see that work being conducted without considering what

was a very important natural resource for the people of Montana. In many instances this work was financed in part if not entirely with public funds. A number of the programs involved a sharing arrangement where federal money was used to pay a large part of the costs. In many instances representatives of other agencies encouraged those practices or at least did very little to discourage them. It was difficult to see that we were using public funds to damage something that was actually important to the public. Sometime after I moved to Bozeman as fish manager in 1960 -- shortly after I came down here -- one of the local clubs asked me to meet with them and talk about fish management. We didn't get a date arranged until the early part of the winter and I remember that the night I went to the meeting was a stormy night. I drove quite a ways on slippery snowy roads. The meeting was scheduled to be with the fish committee with this club and I anticipated half a dozen people. When I walked into the room there were 24 people sitting around the table. And that was the fish committee. You can imagine the outcome of any meeting where you had 24 people on one committee. It didn't really come as a surprise to me but they weren't particularly interested in discussing management philosophy or long-range goals or anything like that. They had a list of all the waters they wanted planted with Hatchery fish; the numbers of fish, the species, the sizes. I tried to explain to them what the division's policy was on fish planting and what my personal philosophy was on that type of management. They weren't interested at all. I felt somewhat like a clerk in a Sears catalogue office -- I just went over to pick up the order. What they wanted and where they wanted them put. It was interesting and there was a lot of that during that time. In fact, later on that same club modified their philosophy over time and by the time I left

the region in the '70s they were thinking about wild fish management and habitat protection. There was a lot of progress made with sportsmen's groups over the years.

In the '60s we couldn't tell them [sportsmen's groups] for sure what the fish population was in the Madison.

That's right. That was probably one of the most interesting parts of my career. The work that we did with electrofishing in Region 3. We were managing a number of blue-ribbon streams across the state. Devising fishing regulations and planting schedules and the management program without knowing anything about the wild fish we were managing. That didn't make a lot of sense to me. We needed to know more about the wild fish we were dealing with. In the early '60s we began to apply the technology we had for electrofishing in big rivers. And of course prior to that time fish stocking had been done on smaller streams where we carried a portable generator out and put it on the banks. We'd block off a section of stream 300 feet or so; 528 feet was what some of us used, that was one-tenth of a mile. We made repeated runs through there and tried to get as many of the fish as we could. We knew we didn't get them all. We'd use the number of fish we took as an index for the number that were there. Maybe we only had 90% of them but it was the number we used for trend data and we'd come back in another year and shock and see how it compared with the previous years.

You couldn't work any stream that was too large.

That's right. You couldn't block off part of the Madison or Yellowstone. There was no way to hold the nets so we were limited to small and medium streams where we could collect data. The mark and recapture method to study

populations has been used extensively in other fields as well as fish and wildlife management. We attempted to modify this electrofishing process where we'd carry the shocker in a boat, float through several miles and collect as many fish as we could and mark them either with fin clipping or a tag of some kind. We'd come back a week or ten days later, go through the same section and then compare the number of marked fish in the second sample to the total number of fish taken. That ratio gave us an idea of the total number of fish in the section.

Later we hired a project biologist and assigned him full-time to work on that project. Dick Vincent took the job and conducted that project very successfully for several years and got a great deal of information about trout populations in some of our bigger rivers. Eventually the population data we got led to the revision of our planting policy for streams; prior to that time we'd been planting larger numbers of catchable trout in most of the big rivers in Montana. Since we were able to make estimates of the number of fish we were dealing with we were better able to modify our study practices. The studies on the Madison-O'Dell Creek, one of its major tributaries showed us when we plant large numbers of Hatchery-reared fish on top of a wild fish population we reduce that wild fish population substantially without regard to the impact of the fishermen. Fishermen are harvesting fish all the time in these streams. Over and above that the introduction of the Hatchery fish was creating some sort of a stress factor on the wild fish that increased the mortality.

Up until that time we thought they were just getting the cream on top and then we realized the economics ... Your study showed we were not adding, we were subtracting.

Right. Dick Vincent summed that up very well. He said that we used to think that the practice of planting fish in the stream, that two and two made six. He said that with the data, we knew that two and two made three. That was a pretty good description. There was one interesting side line on the electrofishing operation that time the fisheries administrator from Australia or New Zealand was here.

Chas Hardy, he wrote his name Chas and that was what he wanted to be called. Chas.

You took him around to look at a number of field projects and met us on the Big Hole River, we had planned some shocking that day and you brought him around to see the operation. I still remember the one question he asked me. The fellows were getting their boots on and the gear ready in the boat, getting ready to make a run down the river. He looked at me with his down-under accent, rather quizzically and said, "I say. Do I understand you right that you chaps actually get in the water when that device is running?" He was pretty amazed that we would get in the water when you mix electricity and water.

Apparently in New Zealand they stay in the boat. They have a lot of safety features in the boat. He asked what safety precautions we have and George said we have a long list of applicants who want to go to work for us.

Well, admittedly, our safety precautions left something to be desired in the early years but we did improve over the years. As you say, initially we were walking ahead of the boats and the people operating the electros and the nets actually got in the water and walked ahead of the boat. In the deep holes, they had to jump on the bow of the boat. In later years everyone stayed in the boat which was a better safety

factor. And we improved some of the safety considerations. We did get a lot of good information from that shocking on the Madison and other parts of the region. Other regions adopted the gear, too. One gratifying thing was that we didn't have many serious injuries. There had been some serious injuries around the country with electrofishing gear, and we did have some near misses and people got a pretty good jolt. That scared us considerably but actually no one was seriously injured or killed.

Tell me about the fish shocking gear.

A fellow from Bozeman, Don Venacle, played a major role in modifying fish shocking gear. Don was an electrician in Bozeman and I met him the year I came to the department. He was on the payroll traveling around the country checking devices for electrofishing. I remember one generator he had just about filled the back of the pickup. It wasn't practical because it limited you to where you could drive. Don was a very skilled electrician and had a lot of good ideas. He'd get some ideas for modifying it and making it more effective. He'd go out and buy some electric components and work in his basement. The thing blew up and that was no concern to Don; he'd go out and buy some more and try another idea. Actually the Colefelt (?) shockers used later on, I believe they were produced in Wyoming, and the Fisher shockers built by a man in Bozeman were pretty similar to the ones Don was building for us in those early years.

I remember Chuck Phenicie saying that in the early years when they wanted to get the shockers going, they'd go to an electrical engineer and tell him what

they wanted and they couldn't do it so they'd go to Don and he'd do it.

He had a good knowledge of electricity, Don did a lot of valuable work for the department in those early years. Another fellow who gave us some help on that project was Norm Strong. He was an outdoor writer who lived up Cottonwood Canyon south of Bozeman. He was on the staff for Field and Stream and also wrote extensively for other magazines, anything connected with hunting, fishing, equipment, management. He even wrote articles on wood cutting. Norm got interested in this electrofishing early on and he went with us a number of times to watch the operation. When we were approaching completion of the Madison-O'Dell study, he wrote several articles for popular magazines and introduced the idea that planting large numbers of Hatchery fish into a stream population was probably not a good idea. So it helped us a little in the area of public understanding.

We had to get permission from the Commission for you to take the plants out of the Varney section just for the test. Not saying it would cure things, we just wanted to find out what the situation was.

Another man who gave us a lot of help on this concept of wild fish versus Hatchery fish was Ed Maynard. Ed owned Channels Resort on the south end of Ennis Lake. Ed grew up on that ranch, it was an operating ranch. When he took over the operation, he expanded into recreational services. He guided fishermen a great deal in the river and he got a few hunters in the fall. Ed was receptive to the concept of managing stream populations for wild fish, so this idea fit into his philosophy pretty well. He gave us a lot of help in the Ennis area convincing people that wild trout

management was a valid approach to resource management. Ed operated that ranch in the early '60s until the late '70s when he sold the ranch. h. I haven't seen him in recent years but I still remember the help he gave us.

I sometimes think of the blunders made; I probably made as much as anyone. Some I don't want to talk about. But one has become humorous over the years. That was the boat accident we had on the West Gallatin River. In the early years we worked with the electrofishing gear. Some outdoor writers contacted the Director and wanted a supply of large trout – as I recall two to three-pound fish or larger for a film they were making on the Yellowstone River. The commitment was made that they would have those fish. The message we got was to go out and collect these fish. We got a few in the first few days. We were out on the West Gallatin River one morning. There'd been a heavy rain up in the canyon the night before and we weren't aware of that when we went out. The river was up considerably and it was really too high to effectively shock and probably too high to be on the river safely. But we were on a tight schedule that spring and this extra work created a problem. So rather than cancel the day's work we made an effort. We floated down to the first bridge to see if we could get any fish. We never made it to the first bridge. We came around a bend in the river and the boat hit a rock and up-ended. There were four of us in the boat and we all went into the water. It was a narrow escape for a couple of us. Al Wipperman spent a night in the hospital; they thought he had water in his lungs. Fortunately he was alright.

Was the generator running at the time the boat went over?

It was running. As soon as it hit the water it killed the engine so no one got a jolt of electricity. It was just the risk of drowning or physical injury. It wasn't funny at the time. During the next week or two I got a couple of humorous notes on my desk. We came out of it alright and the humor has gotten to me a little better over the years. It was an example of the pressure and trying to get a certain amount of work done in a day.

We were all pushed and to a large extent we set our own schedules and wanted to stay on them.

We could determine our schedules at the local level. Everybody felt their schedule was important and the work needed to be done. It could have been a tragic accident, drownings. Al was fine the next day. It was interesting; we shocked several places during that summer and I noticed anytime Al was in the boat if it run aground or tilted suddenly, Al would impulsively grab from going over the boat. Once was enough.

We had fun in those days; anything else you want to add?

I don't think so. Tomorrow I'll probably think of some things that would be interesting too.

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Joe Huston

Joe started with the Department of Fish and Game in 1959. This interview was conducted on April 21, 1995.

Joe, let's start out with your early history, where you are from and how you got started in the fish business.

I was born in Sanders Valley in Monte Vista, Colorado in 1933. I became interested in fish through the influence of a man named Mitchell, who worked for the Colorado Fish and Game at the Monte Vista rearing station. Plus, my Father and brother were interested in fishing all the time rather than playing golf. The Colorado Fish and Game reared such things like rainbow trout, brook trout. I went to Colorado State College for four years, got a BS degree in Fisheries. Started in on a Master's Degree in 1956 and went to the Army for two years and came back and graduated with an MS in Fisheries Management in 1959. I applied for jobs in various states – it was really an "act of God" or the "fickle finger of fate" that I ended up in Montana rather than in New Mexico.

Did you have offers from both places?

Well, I hadn't had one in Montana. I'll have to tell you a story. I was sitting in Fort Collins, I was supposed to drive down to Albuquerque, New Mexico, and leave the next

morning. The night before I was supposed to leave we had a hell of a blizzard. I couldn't leave and the next night George Holton from Montana called. George Holton said later that you were given the choice of whether to hire a thinker or worker, so, you got stuck with me and the thinker's name was Gene Welsh, I believe, and he ended up in Great Falls with Nels Thoresen. That was May of '59. I was offered position of reservoir biologist at Thompson Falls in June 1960. And I've been connected with the reservoirs ever since. I went through the hay-day of Noxon Gorge, through all the bad years and now back into the good years. I've been associated with Hungry Horse Reservoir from '60 to '82 and the Libby Reservoir project from about '66 through '82. The bulk of the federal reservoirs were taken over by the contracts by BPA. Since then I've been involved in quite a bit of native species management, genetics work, largemouth, smallmouth, warmwater fisheries development in Noxon Rapids Reservoir.

One of the things you had to do was sample rivers the size of the Kootenai and develop some night-fishing techniques.

Well, actually the basic idea came from Bob Schumacher for this development of gear for large rivers and reservoirs and started in about 1966. We worked with Washington Water and Power to develop a machine to do it but they were not capable of doing. Then jet boats came on the scene which really eased the problem of working in large rivers. And we threw together a jet boat, some sampling gear and did the first major work in Montana in about 1969.

The technique of sampling from boat was developed by Dick Vincent in Bozeman but he was on smaller rivers and you had to change the timing . . . I think you were the first one to go into nighttime shocking in order to corral the fish.

Yeah, everybody who comes on has to be convinced. But the problem is you can go out in daylight on large rivers and work for two hours and catch two fish and in the nighttime you can go out and work two hours and catch two thousand fish because fish will not run from a boat even if it's lit up with underwater lights at night. Whereas, they'll run from a boat in the daylight, probably from the shadow. And they may even be in different places in the river in the daylight, but in the dark they'll come in the shallows and feed.

Well, that took some doing too. You just don't take any biologist that happened to be walking by and have them run your shocking boat when you're sampling a river at night. You need to do a little bit of work before familiarizing yourself.

Oh, yeah. You got familiar with a section and some people just can't drive at night at all. We had one man who

was a responsible boat driver during the day but whenever he was out at night he got completely disoriented and lost and got us in a couple of jams – wrapped the boat up around a bridge on the Fisher River.

Crosswise against the bridge or crosswise against a large boulder?

The only thing that was damaged was one dog who happened to fall out over the boat and the guy grabbed his tail and hauled him back in the boat and in the process kinda roughed him up and he had some sore spots for two or three days.

But none of the men got hurt?

No.

And you had to do it at odd times during the year?

We shocked in December and about any month of the year. Probably the worst thing was catching kokanee at Bigfork Bay for the hatcheries where we were shocking in late November and December and temperatures down to -14 or -15 degrees below zero where we had to put the shaft of an engine into a fire pit to warm it up enough so we could get two or three batteries to get the thing to start.

How'd you keep it from freezing up when you stopped then?

Just leave it in the water.

Keep the prop going in the water?

Keep the shaft in the water, no problem. We occasionally had to chop the ice away from the boat to get

away, but as long as the prop was in the water, no problem. And it would still pump water and run.

What about the Hungry Horse fishtrap?

Nobody had ever done much work on spring-spawning fish, particularly cutthroat because they spawn during high water. And most of our creeks will have a ratio of anywhere from 100-200 to 1, the difference between low flows and high flows. Making traps stay or having traps stay through high water was very difficult. Our first attempt was in Hungry Horse Creek in 1964; we got all the traps in just right before the 1964 flood hit and after that we picked up parts of traps and whatnot for about two years thereafter. Then we went into what they called a modified wolf trap and eventually after experimenting for two years we were able to make one work. And we were able to fish it anywhere from 2 or 3 cfs flow up to 400 or 500 cfs. Then the Corps of Engineers liked the design so much that they built one on Young Creek that was capable of being operated up to 900 cfs. The one on Young Creek was considerably more expensive and complicated than the other one, made out of reinforced concrete. And I guess when you get \$60,000 in your budget you can do a lot of things, whereas the Fish and Game, where we had around \$2,000.

About the only problem we ever had with equipment was the type of vehicles they sent down to us. Most of them were International Harvester pickups or trucks, commonly called "corn binders" and that's about all they were good for was binding corn. One person took three attempts to come from Helena to Anaconda with one pickup. Very often you'd have a flat tire, you'd put the jack into the bumper and the bumper would come off without lifting the vehicle. One

of them we had to pour Bon Ami into the oil to have the bearing seal up of the rings. Great joy.

I can remember one order was to put in a radiator and it was too small. I don't know if you got any of those but on a real hot day anything other than a flat, level road, they'd boil over. We finally realized that you had to specify radiator size if it wasn't International.

Then I guess it was Jack Vashro that finally got International Harvester to admit that they put together their second class parts and made them into vehicles for bid vehicles.

Yes, we got the factory seconds. And that's essentially when we started getting out of corn binders.

We had a 1960 corn binder Suburban? Always froze up when the weather got wet and cool.

Yes, I drove it a couple of times. It formed a ring of ice around the carburetor and choked itself to death everytime. Real cold weather was fine and just plain wet weather was fine, but if you had wet weather right around freezing and the thing would start to slow down you could hear it choking itself and finally it would just leave you along the side of the road. Take the air cleaner off and look down, there'd be a little ring of ice choking off the carburetor. Soon as that melted off you could crank it up and go again. I had the joy of driving over McDonald Pass with Bob Mitchell one time; it took us about three hours to get over the top, coasting down the other side.

What are some other accomplishments?

Another major accomplishment was helping Washington Water and Power into a new reservoir operation

plan that went into effect in 1986. We were able to convince the company to reduce the overall drawdown and make the reservoir much more stable. Which in turn has led to tremendous improvement in the Noxon Rapids fishery and measure by fisherman days; prior to 1985 it may have shown up on the creel census about 300 man-days per year. Now it is up around somewhere around 10,000 and 15,000 man-days per year. And this is strictly for a warmwater fishery comprised of largemouth bass as a primary species and smallmouth bass as a secondary species. An occasional large brown trout as a bonus.

Your efforts also convinced the company to put some effort into fish and wildlife.

Another accomplishment is keeping misces shrimp out of Hungry Horse Reservoir and Noxon Rapids and Libby reservoir. Again we had some assistance from the Helena office on that little bash. (Also see Bob Domrose interview about misces shrimp.) Maybe another accomplishment is a major effort toward the restoration of the westslope cutthroat in waters containing non-native or hybridized fish. It's a project that started in 1985 and is still ongoing.

That's had you sampling all over western Montana?

Right. I partook in a little of the trips, but they collected most of the fish, worked over all the lakes from the South Fork Flathead River drainage plus thirty or forty others and they estimated 500 miles on their travels and probably about 200 miles by horseback. And in recent years, we've been using the helicopter which makes it a lot easier.

We also chased spruce bug worm down on the Bitterroot, you were in on some of those.

Yes, down in the Bitterroot, on the west fork. There'd be the Forest Service biologist talking to the airplane pilot saying stay away from that creek; and there be'd the bug man saying hit the creek. I remember we didn't have any fish kills.

If you had to do this over again, would you choose the same kind of career?

Same place. Yes. I surely would.

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Keith Seaburg

Keith Seaburg started with the Department of Fish, Wildlife and Parks in 1962. This interview was conducted on September 6, 1993.

Keith, let's start out with a brief history of where you grew up.

Okay. I was born in Grand Rapids, Minnesota, on April 22, 1925. My Dad and Mother had a small farm up there in the Iron Range and I and my two brothers were raised on that farm. I went to grade school in Marble, Minnesota and high school in Coleraine, Minnesota. I graduated in the spring of 1943 and enlisted in the Navy, aviation cadet program. I spent 2 ½ years in flight training and was stationed during the war. I was discharged in 1945 when I started college at Coleraine. Then I went to the University of Minnesota and ultimately graduated with a Bachelor of Science. I started out in Forestry but decided after a year that the fisheries and wildlife management were more to my liking.

We know that you worked for South Dakota and Minnesota for several years before coming to Montana but I do remember that on one of your vacation trips, you got into a little preparatory work on the Marias

project which was one of the major objectives or operations of the fisheries division.

Yes. It was, really was very interesting. They were, at that time, testing out the distribution of toxicants by airplane. Of course, a lot of it was done by grunt work in these sloughs or areas but they were testing, or designing a venturi system in a tri-motored Ford airplane. I happened to be around at that time and the testing of that where you dumped the rotenone or the toxicant into the venturi, which then distributed the toxicant in a pattern rather than in the cabin of the airplane being filled with the toxicant. That project was exciting for me.

The objective was to get the venturi to suck it out of the barrel so all the crew had to do was pour it into the barrel. But, as I remember, it would bridge over and then you'd poke it with a shovel and it would blow back into the interior of the airplane and you'd be covered with this dust. At the time we thought was nothing but rotenone, but later found out it had toxaphene with it.

After getting out of school you worked for Minnesota and South Dakota before coming to Montana?

Yes. My first job was with the Minnesota Department of Health in the Water Pollution Control division. I was a water pollution control biologist doing pollution studies in Minnesota. After about two years the Dingell-Johnson program started to provide additional information to the conservation department, fisheries division, and I did creel census work on some of the lakes around Detroit Lakes Minnesota. After that, one of the research biologist who was down in Glenwood Minnesota took a job with California and I started then as a research biologist in Glenwood Minnesota in 1953.

How long did you work there?

I worked there until 1962. Then I went to South Dakota as a regional fish manager, stationed out of Webster, South Dakota. I worked there for about two years. Then I took a job in Montana, in Missoula, as a project biologist. Several of the major projects that first winter were using air compressors to try to prevent winter kill on Georgetown Lake and Browns Lake.

Can you describe the project?

There were perforated hoses laid down in the bottom of the lake and as I recall they were weighted so the air that was in the hoses didn't float them to the surface. But there were lines set out there in several directions. We tested the oxygen throughout that period on Georgetown and also on Browns Lake. Early on in the program we were able to sample fairly close to the air lines, but as the season progressed towards spring, we were working away from the open water or rotten ice created by the air bubbles that were

taken to the surface. It was a project that Fisheries did for several years but finally determined that the effort was not worth the benefits. It raised the oxygen level immediately in the area but of no great dispersion.

And there was always the problem that somebody might fall into the hole and sue the department. I remember in Kalispell we had to buy a couple of cows that fell into a lake. We never lost any people in Georgetown Lake, though.

No, no.

What was your next job?

I was offered a job as the Information and Education officer in the Missoula region. Perry Nelson who had been the information officer got the job as regional supervisor in Great Falls and I was given the opportunity to become the regional information officer which was something I was pretty happy with. The department gave me the opportunity to learn how to do a better job presenting information to the general public.

As I remember you had one fisheries project developing a film on Rock Creek. Some interesting photography on stonefly.

Yeah, it was interesting. We were able to get a housing built for standard 16 mm cameras and we got some pretty good underwater footage; the habitat; and also used a time lapse movie camera to show the stoneflies coming out of their cases and they become full-fledged fliers instead of strictly an aquatic organism. You had to have the lights so bright that your subjects sometimes expired before they got

fully hatched? We learned from it and moved the lights further away.

Then you moved from that job to regional supervisor in Miles City?

Yes. In 1970 I came down to Miles City as a regional supervisor.

As a fisherman, an old 'fish monger,' we used to say, which project do you think were most important?

Well, in the early 70s coal mining was really starting to begin production; there were many companies that were eyeing the water of the Yellowstone River and some of the other rivers in Montana for perhaps coal slurry lines or cooling water for power generation. The knowledge that there was on the Yellowstone River fish populations and impacts were quite important. A lot of studies were planned and worked on to really look at the Yellowstone River, primarily in this region. Also in some smaller tributaries. So the fisheries aspect really expanded, the number of personnel really expanded in that period.

It wasn't just fisheries personnel; they expanded your whole region with this coal development?

The impact on wildlife and recreation had to be considered and researched. When I first came down here there were a total of 28 personnel, including game wardens, wildlife biologists in various areas in the region. In the height of all of these studies there were 28 people in the main office.

The project, South Sandstone, turned out to be pretty important to the fisheries in southeast Montana.

Most of the work was dealing with ponds. There was a real need for water based recreation in fisheries and utilization of water for the agricultural projects, etc. The South Sandstone project was great for fisheries and recreation, but also the ranchers in South Sandstone drainage, who were mainly raising hay for their livestock. This project we called water spreading, as compared with straight irrigation. The water spreading utilizes runoff water in February and March and for the rest of the year there's no irrigation water utilized. That part of the year it was strictly for fish and associated wildlife and recreation. So it was a win-win project for the ranchers and also for the wildlife resource. I had a lot of help with SCS and the ranchers and it was a fine cooperative venture and I'm real happy with the way it finally ended up.

How did the water spreading worked compare to irrigation? What time of year are you storing water?

Well, basically a certain percentage is stored for fish year round. But it's only during high runoff in February and March that water is diverted to these particular fields. The interesting thing about this water distribution on these soils is when they are frozen. So it gradually thaws out and the water goes into the soil. As a matter of fact, any water that is put on a little bit later would really not cause any increase in production; it would actually be a detriment. So we were able to bounce the water levels to enhance northern pike reproduction.

Let's back up in time a bit. Something you did when you were in one of the other states before you came to Montana. It was quite a bit of importance to fish managers all over the country. You developed a

method of sampling fish for food habit studies that was unique at the time.

I developed a system of flushing the stomach contents from quite a few species of fish; there are some that would be very difficult to do that. Basically, prior to that to study food habits, fish had to be sacrificed and stomach contents cut out and preserved. This method utilized a double tube; one small tube that had pressurized water going into the stomach and then forcing the food contents into a jar. It really advanced a lot of the food habits or knowledge of food habits at that time. Things such as you could go back time after time over a period of time flush the contents from the same fish you might have sampled several weeks prior to that. We learned quite a bit more about digestion rates and seasonal utilization of food. And the fact that small fish are able to get a greater percentage of food, considering their size and weight as compared to larger fish who have no opportunity to utilize any more than the smaller fish. So the daily rations were pretty well correlated with the growth rates of these fish and also the maximum size that could be achieved by some of these fish. It was very interesting and I was pretty happy with the results and the publication of those results.

It's a pretty impressive addition to the things a fish manager can use. It's written up in literature but not quite the full summary. people should know that it started with something other than the tube.

I thought at the time one could use a suction method to suck the contents out of a fish's stomach. It didn't work very well.

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Bob Domrose

Bob Domrose began with the Department of Fish, Wildlife and Parks in 1963. This interview was conducted on April 20, 1995.

Bob, let's start with your early history and how you got interested in a fisheries career.

I was born in Milwaukee, Wisconsin, back in 1929, during the Depression days. My Dad and I and, in fact, my whole family except for the girls, enjoyed fishing and my Dad used to get off whenever he could to go fishing. He worked as a cook in a major hotel in Milwaukee. He loved the outdoors and whenever he could get away from the kitchen he would go fishing. So, I developed an interest in fisheries. We used to get the old '37 Chevy and the old bamboo poles, about half a dozen of them, roll them up and put them on top of the car and take off every weekend to a nearby lake. We'd fish the hell out of the lake. We were coming home at night. These were mostly day trips, but every year during the last part of August, used to be the worst part of the hay fever season. So, to get out of Milwaukee area we'd travel north to northern Wisconsin and spend two weeks up there. We'd rent a cabin for two weeks and do nothing but fish for two weeks. It was great. I'd come back late every year for school so I'd have to catch up on everything because school had already started.

How did you learn about the fisheries field?

I always had an interest in the west. In fact, my high school annual said that Bob Domrose wants to go to Idaho, but not to pick potatoes. I was talking about going out and working for the Forest Service in the summers and find out what the west was like. About a year out of high school, my friends and I wanted to take a canoe trip down the 'ole Mississippi all the way down to New Orleans. But, fortunately, we couldn't find an old canoe. So we bought an old '29 Chevy for \$89 and made a trip around the country. We came through at Yellowstone Park and had quite a few good experiences on that trip. At that time all the bears were coming out of the woods and we had a pile of donuts that we'd got from a baker in Ennis, Montana, where we stayed a week because of problems with the car. One of my buddies that was with us played the violin and gave them a concert the day before we left. Then the baker gave us four bags of donuts. Here we were dumb city kids with all these donuts and we started feeding the bears. They were climbing all over the car and we were taking pictures of them. They were crawling on the hood and some on the windows. We

were face-to-face with the bears through the glass of the windows.

I went to college for two years at Wisconsin's State Teachers College, which is now the University of Wisconsin in Milwaukee. While I was going there I wrote to Montana State University to find out about their programs. After my third year, I transferred to Montana State to get my BS degree. I knew in Montana you needed a Master's Degree to get in as a fisheries biologist, so I didn't apply. I then applied to graduate school, probably in the late '50s. Fortunately, Doc Brown was a good friend of mine and managed to find a project for me to work on. It was on the aging growth of brook trout in Montana. Not significant work but I did manage to get a lot of information about brook trout both in western and eastern Montana. I did field work in the Beartooth Mountains, near Silver Butte and Cooke City. Vern Waples was the game warden in that area and had horses, so we'd go to several places. All I had was a one-man raft to do the gill netting with and it was pretty rough. You'd go out to a lake -- you know how the winds are in high mountain lakes. They blow in one direction for two minutes and another direction the next minute. Here I am in this one-man raft with a gill net trying to set it to get a sample. Sometimes it took me an hour to set the net because every time I'd let the netting out the raft would be blown over on the top of the net and I'd have to start all over again.

Nels said that he has a slide of a rubber raft near the shore and a gill net set in the pond and you can see the net is in a perfect S shape.

Yes, that's how mine were set. Fortunately, I did get samples from those lakes and got some information on

brook trout in western Montana. Tried to get a whole synopsis of the sampling that was done and managed to do a large array of samples to get information.

What about some of your projects you worked on?

Some of the projects I recall... it was in the winter and there was an ongoing project with aeration of Georgetown Lake to improve the oxygen content to prevent fish kills in the winter. There was also one at Brown's Lake. I remember going up to Georgetown several times with Bob Mitchell who clued me in as to what was going on and we spent several days trying to flush out lines and keep the lines open so they wouldn't ice over. When we were at Brown's Lake, we'd get our work done as early as possible and head over to Trixie's saloon. That place really impressed me. There were banks of snow about 10 feet high outside the saloon and sunshine would be real bright and you'd get into the saloon with only two 15-watt bulbs in the whole place and a thousand antlers hanging all over the place. We'd come in and have a little refreshment before we'd go back home. Trixie always had a bunch of salad and hors d'oeuvres and that would make our lunch with a few beers. Then you'd come out of that place and it was so blinding because it was so dark inside.

Then you moved to Kalispell in the spring of '64?

Early summer of '64; I remember that quite well because Kalispell was engulfed in the '64 flood. We tried to get housing but it was pretty difficult because there were a lot of people evacuated from the floodplain and they were trying to find a place to live. We moved into Ophie's old rental and lived there for about a year and a half. Found this place we are living in now and been here ever since.

I'd like to tell about one of the big blunders I was involved in – the misces shrimp introduction in 1968 which George Holton said was one of the biggest biological disasters ever occurred in northwest Montana. He's probably right.

First of all, a little bit of background. British Columbia had some success with growing large kokanee in the west arm of Kootenai Lakes. They attributed that to the misces shrimp that were in the system. I don't recall if it [the lake] was planted or if the shrimp were natural. I think they were planted but I'm not sure. At any rate, they were catching kokanee that were two and three pounds and everybody took notice of that. Several states and provinces thought this was the real "cat's meow" as far as raising kokanee. A lot of other states were going to start planting kokanee in their lakes. They were planted all the way from Lake Tahoe in California to Pondera County, Montana and all kinds of lakes throughout the northwest. Montana was one of the last ones to get on the band-wagon. We decided to get some of these huge fish into Region 1. So Bob Schumacher and I went to Waterton Lake in 1968 where most of the misces shrimp were collected. On the first occasion, in the spring, we didn't catch very much -- weren't too successful. In the following fall we went up and towed drift nets in the middle of the night while the shrimp were migrated up towards the surface and picked up a fair amount of shrimp and transported them back to Montana and planted them in the lakes. It was kind of an enjoyable trip. We spent a few days up there. We drank beer during the day and went out at night and caught shrimp. We were competing with some California fish biologists up there at the time and they had bottom trawls with electric winches; they did a lot better at collecting than we did. Unfortunately, we found out, we were successful in

collecting a fair sample of misces shrimp. We had a Hatchery truck where we kept them cold with ice water, came back and immediately planted them in about five or so lakes in northwestern Montana -- Swan, Whitefish, Bitterroot, Ashley, Crystal, Holland and Lindberg lakes. By the time Holland and Lindberg were planted, I guess they were all dead by the time they got there. So fortunately we didn't get any success in survival in those two lakes. However, we did get very good success in Whitefish Lake, Swan Lake and Bitterroot.

As time went on we sampled and we started picking up more and more and density increased in those lakes. Oh, another lake was MacGregor Lake. In about three or four years all of a sudden we discovered something was going wrong and this was in Whitefish Lake where we had every year we'd take kokanee for the spawning operations for the Hatchery. In the fall of that year we went up to the north end of Whitefish Lake where the spawning area was and set our nets out and, lo and behold, the kokanee were not there. We must have caught around 50 or 100 kokanee whereas previous year we caught 100s and 100s of kokanee and got a good supply of eggs. The following year the same thing. There was something wrong. Something had happened to the kokanee. That's when we started thinking there was some problem with the misces shrimp. MacGregor Lake was a lake where we stocked kokanee. We stocked 200,000 a year. So, we had these problems in the lake and we didn't really know what was happening except that the misces densities were increasing.

We found out later that the success they had in the west arm of Kootenai Lakes was that the misces normally live on the bottom of the lake during the daylight hours and migrate to the surface at night and then return back to the bottom as

light increases in the morning. They call it negatively phototrophic. They have an inversion to light. Anyway, what happened here is that the misces shrimp were coming up towards the surface at night and feeding on the zooplankton which was the main source of food for kokanee. At that time because kokanee are strictly sight feeders they don't come in contact with the misces shrimp. By the time the misces shrimp return to the bottom they aren't available to the kokanee for food. What these shrimp were doing was consuming the food source of the kokanee, the zooplankton, the kokanee were getting nothing in return. The shrimp weren't there at the time the kokanee were feeding. So what happened, we found out later, in the west arm of Kootenai Lakes was that there was an upwelling in this part of the lake where the misces shrimp were forced into the thermacline area where the kokanee were feeding and of course this is where they were able to consume great quantities of misces shrimp and reach their size. This was kind of a freak thing that happened and this upwelling doesn't happen in too many lakes.

Another phenomena we found out later that even though we had fairly good kokanee populations in Swan, Bitterroot and Ashely despite the fact that the misces shrimp were stocked in those lakes and they did survive and did become part of the food source in the lake, they didn't wipe out the food supply. Kokanee populations still thrive in those lakes as they do today. The main problem was the predator that was involved in this system whereas in MacGregor Lake, Whitefish Lake... Whitefish Lake has large populations of lake trout. These fish flourished in these situations. They had increased food supply -- the misces shrimp lived in the bottom and the lake trout increased in numbers. The juveniles were able to survive and increase in

numbers with the increased food abundance provided by the misces shrimp. As a result the lake trout population expanded and the prey relationship in MacGregor and Whitefish lakes changed dramatically. Whereas the prey population was in great abundance. It switched around so that the predator population overcame the prey population and as a result the kokanee were wiped out in MacGregor and Whitefish lakes. Now the same situation in the other lakes which did not have this efficient predator, Swan, Ashley and Bitterroot, the populations remained relatively stable. They still have good populations of salmon in these lakes today. That's the theory behind it and I think it's true.

This all happened in 1968. What happened later in 1981, by 1981 the first misces shrimp was found in Flathead Lake. Steve Leathe was doing some fry sampling there and he picked up some in some of his fine fish nets and in 1983 we went from the population where it was barely visible to huge populations of misces shrimp in Flathead Lake. As a result we had the same occurrence that happened up in Whitefish Lake. We had runs of excess of 50,000 fish coming up into MacDonald Creek and in one year time that dropped down to 200-300. It was a complete elimination of kokanee in Flathead Lake and has never really recovered. Now there are some who theorize that part of the problem was because of habitat conditions that changed as far as logging and siltation, overfishing. A few years before that they caught thousands of fish in Skidoo Bay ice fishing; the ice fisherman caught their limits, but that to me is not the significant problem. The whole thing was the environmental ecological change that occurred in Flathead Lake with the advent of the misces shrimp.

Other states were doing the same thing without understanding this whole relationship. In some cases they did well, in some cases they didn't.

Not all people agree with me, but I think this is exactly what happened. We had problems, you know we had studies on trying to improve spawning areas in the Flathead River and we had the fluctuations in the Flathead River where the spawning was limited to kokanee, but this is one that put the nail in the coffin as far as kokanee are concerned.

What were some of the things you enjoyed doing up here?

Well, there was some stream habitat work going on, pretty much in eastern Montana a lot and to some extent up here in northwest Montana. A lot of my work involved lake surveys and working with some of the bigger lakes in Montana outside of Flathead Lake. Flathead Lake was Laney Hanzel's project, but I had a special interest in Lake Mary Ronan. We had a fishery there in the early '60s that had decreased in numbers. The fish had somehow disappeared. Kokanee fishing fell flat, there were very few caught but the ones that were caught were large. This indicated that there was poor survival of those fish that were planted. It may, in part, be because the fish were planted too small, maybe planted a little too early and ended up down in the mud. Some may have been too small to survive. Any rate in the early '60s the fishing was very poor the catch rate was 'one fish in every five hours' which is not acceptable to fishermen. Another thing it was only a summer fishery. There was no fishing in the winter we think because there were two resorts on the lake and people decided that we should save these fish for the summer fishermen. We decided we were going to try to provide a little more fishing

for the lake so gradually we started a winter fishery that was restricted to weekends. Lo and behold everyone thought winter fishing would be great because no one's hit the lake in the winter. It was still the same thing -- not very much at all. So we went got together with the Hatchery people and started stocking a little bit larger fish. We were more careful in how these fish were released into the lake and what time they were released. By the mid '60s the fishing started to improve and we had some great fishing there by the '70s and '80s and opened up the fishing to winter fishing all the way to the middle of March. Winter fishing was terrific and about 80% of the people caught limits of salmon without affecting the summer fishery. Along with that we were monitoring water quality of the lake and found some problems with oxygen temperatures, maybe the oxygen was too low down in the bottom (the temperature was cool enough but there was no oxygen down there). The thermacline of course got smaller in the summer and there may have been only a couple of feet of habitable water where oxygen was high enough and water temperature was cool enough in the thermacline that kokanee could survive well. I don't know what it's like to this day but I'm sure it hasn't gotten any better. Of course, we have other problems now with Lake Mary Ronan with the introduction of exotic fish. Perch were planted and now we're getting perch out of there that the last gill netting efforts... you should see the nets last fall they were averaging about 35 perch per net and lot of them were 12" to 14" long.

Yes, bucket biology is going on all over. Walleyes are being spread around. I saw in the paper the other day where reidside shiners were caught in the Big Hole River west of the divide.

Of course this latest thing with the whirling disease. All these years we thought that sculpins were great.

They were as long as we didn't have whirling disease. That's one thing you and I can be kinda glad is that we are not there to fight the whirling disease.

One of the disturbing things I heard at a meeting a few days ago where Trout Unlimited was saying that in the Gallatin where they found no evidence of whirling disease, they checked the sculpins and didn't find any spores on those either. But where they did find whirling disease in trout they also found them in sculpins. So this is a little disturbing that places where.. you know we may find them in other waters.

I think that's true, because we haven't looked in some places doesn't mean they aren't there.

Yeah, maybe other species of fish too, we'll find them. Anyway, the other problem I see here in northwest Montana is the northern pike introduction. When I first came to this region there were two bodies of water with northern pike; one was Echo Lake, a closed basin lake where water could get in but not out and Lone Pine Reservoir, where there were some downstream affects going into the lower Clark Fork. We had some 60 bodies of water in northwestern Montana where the northern pike populations were apparently dragged around by people who liked northern pike. I call them Norwegian pike because there's a lot of Scandinavians back where both of us lived, in Wisconsin and Minnesota.

Kalispell region has a lot of small bodies of water that are pretty easy to manage.

That's right. I did focus a lot on that type of management. Most of the small lakes outside of wilderness areas we covered; high mountain lakes with helicopters with Don Brown and Doug Getz and Cliff Higgins. The ones that had established a good fish population we left alone. Those that didn't we tried to get a stocking program and manage them with stocking every three or four years with fry. I think it's worked pretty well in a lot of these lakes. And trying to keep the westslope cutthroat as a viable entity .. Now we're coming into the bull trout problem in the Flathead River drainage, high country lakes because of the misces shrimp. That's my own personal opinion. Dolly Varden have limited spawning areas, they have to go upstream to spawn. I think there's predation because of some of the smaller fish coming down and creating problems. You also have the lake whitefish on the increase too that prey on small fish. I think those problems are related to the misces shrimp and the whole ecology change of the lake in the species composition. Also lately we're seeing a decline in the perch population in east bay. Those fish aren't there like they used to be. Lake trout are roaming around looking for more forage and are foraging on perch, too. The Swan River, for example, is an example of another drainage, the bull trout are actually increasing and we're having very good success with bull trout. I'm sure there's problems with degradation of the habitat through logging.

What about the logging impacts?

Yes. We were starting to get concerned about logging impacts and problems with heavy silt. From the mid '70s to the mid '80s, I was at Lake Mary Ronan working with water quality and doing stream and lake inventory. Then the

Stream Protection Act started to include private landowners where they were encroaching the streams. There was a period where they established minimum streamflows particularly in eastern Montana. We had a lot of proposed micro hydro projects in this area and spent a few years in the field trying to pick up information on water flows, minimum flows. Tried to establish minimum flows on several creeks in northwestern Montana, so we could keep these streams in the event the micro hydro projects proved that we could limit them to the amount of water they took off. We continued the lake and streams surveys and started to work more with other agencies. Worked with Plum Creek on their logging sales. During this period we increased our staff to work on BPA studies – studies impacting reservoir construction, and past reservoir construction, Flathead Lake, Kootenai Lake and Hungry Horse Reservoir.

The period of illegal fish introductions, the miscegenation impacts, the population of bull trout and westslope cutthroat in the drainage and Kootenai Reservoir, trying to establish westslope cutthroat populations. As the reservoir was built and competition increased the westslope cutthroat dwindled to the point where its probably getting pretty rare up in that Kootenai Reservoir right now. We decided to go with waters where we started planting fish in some small lakes where catch and release and trophy trout fishing. We must have about seven or eight lakes where we have this type of management. We also had an attempt to use this on our wild trout fishery on the Thompson River. We did a study on that for two or three years and found out there was really no change in the structure of the fish population during that period. So that one was dropped, but we do have some small lakes that were stocked for trophy fishing. In my opinion we might be going overboard with the trophy lake

fishing because I think in a few lakes, about four or five lakes might be enough, but these are stocked fish and the trophy lake limit is one fish over 22" which I don't think most of these lakes produce a fish that big. My idea would be to bring that fish limit down to 15" or 16" so a person had a chance.

Your limit at 22" is essentially zero.

That's right. The other point, I can see where there'd be a certain amount of lakes spaced out around the region where people had the opportunity to catch a large fish but some people can start rebelling because they've taken some good lakes where people were catching fish very fast and they got a lot of 12" fish. They've taken these lakes and turned them into trophy fish lakes.

Does that satisfy a smaller group of people?

Yes, that's right. They talk about catch and release fishing and trophy fishing. I see this more as an area where you have wild trout waters. I think that's fine. You can reduce populations in a hurry by taking all the large fish out of a system. In stocked lakes, its put and take and it really doesn't matter if you catch a fish or not. There's always more fish to put back into the system.

To my recollection we only had two or three streams where we had catchable plants, 7" to 9" fish. We pretty much kept them out of the system. There was one on the Swan River we tried in the late '60s on catchables; we kept a creel census to find out how many fish were returned to the system. We considered about a 40% return as being acceptable as Hatchery plants. We tried this for one summer and found out we got a return of about 7% - 8% and we eliminated the Hatchery plants in the Swan River. We had

one in the Thompson River for a while and one in the Pleasant Valley Fishery River. Most of our Hatchery plants were 3" - 4" fish we used for lake management. It was very important for management of lakes where you are totally dependent on Hatchery fish.

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Robert Schumacher

Bob started with the Department of Fish, Wildlife and Parks in 1965. This interview was conducted on November 11, 1993.

Bob, let's start off with a little bit of your early history.

I moved to Montana in November 1965 and started working in the Kalispell office as a fisheries manager. I retired in November 1982 at the age of 64. I retired in the same position I had when I came here 17 years previously and that was my choice when I moved here. I didn't really enjoy working in the Capitol office anymore after leaving Minnesota.

We might back up a little bit here and tell where you were born and the fact that you had part of a career before you came out to Montana.

I was born in southwestern Minnesota on a farm near a small farm town called Heron Lake. I went to school there and then I joined the Air Corps during World War II. After the war was over I got the GI bill and went to the University of Minnesota to get my Bachelor's Degree. Then I spent about a year and a half in graduate school working towards a Master's Degree in fisheries management. I did not finish my thesis there because I had a job offer for the University of Minnesota. I had worked summers during the time I was

in an undergraduate position with the department, so when I finished my Bachelor's Degree they were anxious for me to come to work for them and work in the field of disease and nutrition program. I wanted to become a waterfowl biologist but then heard that there was such a thing as fisheries and game people. Prior to that I thought that all people who worked for conservation departments were game wardens. And most of them were at that time. At that time, before the war, we had one fisheries biologist in the state of Minnesota, the land of 10,000 lakes, you know. After working one summer with the fisheries research unit in the department I found out that working with smaller populations in smaller environments lent itself to a lot more manipulation of species in an environment than working on an international population of waterfowl. So I changed my direction to fisheries management field. While we were employed by the Minnesota department, I started out as an aquatic biologist II, I worked out a system for controlling the disease programs in the trout and initiated a new formulation of dry pellet trout food which was a complete change from the wet ground diets of livers and spleens of butchered

animals. I moved up to aquatic biologist I and took on the steam survey jobs and hired summer crews to write surveys and winter crews to write reports.. write the surveys up into reports for management. I was promoted to research biologist heading up the coldwater research program and I worked with our regional and area biologists in designing and implementing research projects on coldwater fish -- trout and smelt, primarily. One day as I was sitting in my St. Paul office, you stopped by my desk said I had a job in Montana. I had seen eastern Montana and wasn't too interested -- it didn't look like trout habitat. On my way through Whitefish to Portland for a meeting, I stopped and Art showed me some of the area around the Kalispell region. I was impressed. Two months later I was working at the Kalispell office as the district fisheries manager.

At that time, we didn't have a parks unit. Some of the first things I did was to review the stream and lake survey programs and the stocking programs. We also got involved with the Helena staff and the other district biologists in implementing some long-range planning. There were over 600 lakes in the district and about 5,000 miles of trout streams from minor tributaries to large flowing rivers like the Flathead. The lakes range from high-mountain lakes 40 to 50 acres and were generally inaccessible except from horseback or helicopter. We'd use the helicopter in the early days for surveying. Most of those lakes were surveyed within the first three years I was here.

The tanks for planting fish by air were developed before the method was developed to use helicopters to get crews into survey lakes. I think you utilized that to get ahead of the planting trucks.

We recommended stocking the high mountain lakes, to see if we were going to fly the fish in with a helicopter or a plane. By necessity they had to be small fish because you had to carry a large ratio of water for the fish. So, our practice in these high mountain lakes was stock what we called "swim-up fry" which were trout that were usually an inch and a half to two inches in length because you could carry a larger number of fish per gallon of water at that size. Because we were planting very small fish, repeat stockings were delayed for approximately a five-year period. The stocked fish could grow up pretty well before you stocked again with a small fry fish. To reduce the mortality on the stocking program, it seemed to work pretty well as long as we had a span or a range of different lakes being stocked in different years, reduced the amount of helicopter time and it also spread the fishing pressure out on those high mountain lakes. Along, in addition to the boom shocker which we used on a large 18-foot flat bottom skow like they fish in the southern waters with, I added electronic temperatures devices similar to what we used in Minnesota and portable sonar depth finders primarily for doing surveys in high mountain lakes and for locating netting sites by various depths quickly rather than trying to do it with a hand line.

They started making standard chemical re-agents for us to use in our water chemistry so chances are there was a better uniformity in the readings from a given sample over a period of time, if the re-agents were standardized in large batches.

We also started working with the Forest Service, because what they were doing would subsequently have an effect on fish populations. So about the second year or third year I was here, I started working with rangers from the individual ranger districts. At that time we had four national

forests in District 1 and about 20 or 21 ranger districts in Region 1. We discussed logging practices, making too large a cutting in a drainage, clear cuts, and the riparian activity of harvesting right down to the streambanks. They got involved and worked with us on the fisheries, esp. planning road locations, design and sizes and types of stream crossing structures. It was an attempt to reduce the erosion problems that occurred from road construction where water would come down from a newly formed ditch and pour water right into the stream. They also installed small culverts to spill the ditch drainage water over the bank or over the slope so the water had to filter down through several hundred feet or hundred yards of forest ... before it had a chance to enter the stream. Also, sizing culverts -- they never tried to put in a bigger culvert than was absolutely necessary, based on what they figured the high flows might be in about a ten year period. But, looking at the number of culvert failures and bridge abatement failures over that period of time we convinced them it was cheaper in the long run to put in a more adequate culvert or a more extensive bridge that had a wider span or better footing foundations so that it would not wash out and add a lot of fill and sediment to the stream to be carried down and spread over the fish habitat area.

You convinced them that it was to their economic advantage not to have to put in something that they would have to redo?

That's right, they knew that doing it poorly (erosion) was bad business. It also convinced the ranger of each district that we had concerns about their land management practices. It soon boiled up to the forest supervisor and very soon to the regional forester. When I came here in '65, there was one fisheries biologist and one game biologist in the

regional forest. And this region forest encompassed, I'm not sure how many, maybe 12 forests in total. Four were in my district. Within about three years the Forest Service had fisheries biologists in almost every ranger district plus some staff in their forest supervisor's office. In that same period of time, they quickly put on hydrologists to help figure out culvert size, bridge size, gradient problems, runoff before and after a clear cut or before and after a selective cut as it would impact the stream in high flows and scouring. So in a very short time, within a period of about five years, the Forest Service was pretty well staffed with trained fish biologists, game biologists, hydrologists that helped us in strengthening our argument for better land management.

To their credit they [Forest Service] expanded.

Yes. Some of the environmental concerns didn't actually start for about another twenty years, so they started being concerned about fifteen years before that and some things were less harmful to the fish and wildlife populations.

It comes full circle. Bob Mitchell said that the first fish biologist in Montana worked for the Forest Service; a fellow by the name Ray West. He was instrumental in getting the five-year planting program set up, they were way ahead of what had been before, which was no direction at all. Then Montana began to hire their first fisheries biologist in '48, expanded and now we work with the Forest Service on environmental concerns . We've helped each other.

That's very true. We had good cooperation from the Forest Service up to the point where it did not affect their total cut; or their economic method of harvest; or their most economic method of harvest which eventually became clear-

cutting. Wasted a lot of timber and exposed a lot of land to erosion without cover; put barriers in the way of wildlife movement and wildlife habitat. But they were working in the right direction; at least they were moving in the right direction at that time.

Another contribution I made was the instigation of federal grants to protect the upper Flathead drainage and to reduce the impact of the Bureau of Reclamation dam discharges on the kokanee spawning habitat. In 1973, Cliff Martinka who was a wildlife biologist in Glacier National Park, contacted me. They did not have a fisheries biologist in Glacier Park at that time. Cliff gave me a call one day and said, "you know, we heard there's going to be an open-pit coal mine developed down some tributaries in the North Fork of the Flathead." We had heard that too. Sage Creek Coal Company was doing some exploratory drilling to define the limits of the coal bed. We were concerned that any operation of soil movement in the size and type that would occur in an open-pit coal mine would probably wipe out a lot of fisheries habitat on the whole North Fork which was one of our main bull trout and our main cutthroat trout spawning avenues; most of these fish spawn in a smaller tributary but they still have to negotiate the main North Fork down to the Flathead River and into Flathead Lake. It would also bring tailings and probably mine acid from the exposed arsenic that is usually associated with that type of deposit plus the organic material of the coal.

We contacted all the agencies that we could think of in this part of the country that might be concerned about a coal mine development on the Flathead River. And of course, hope that some would have some funding that might be available. We had a good turnout at the meeting, about 50 people, from agencies and some newspapers as well; a

representative from Sen. Baucus' office and I don't remember if Pat Williams was on board at the House of Representatives at that time or not, but it seems like he was. But we had representatives from Congress at these meetings and we tried to stir up enough enthusiasm to go home and talk to their bosses about the problem and come back for another meeting about four or five months later and see what they had to offer. Well, they all came back, at least most of them, for the second meeting, but nobody had anything to offer in the form of funds or help with our problem. What we needed was "bucks." In the meantime, I talked to the Helena office about the problem and our need to acquire enough data background on fish populations, fish habitat, water quality and the stream biota of insect larvae that fish feed upon. We needed to have some mitigation if this coal mine developed. It took almost a year but Sen. Baucus did get an appropriation in Congress for a study on the North Fork and its impact from the possible coal mine on aquatic life. It seemed like it was about \$1.9 million, the authorization. So, the Yellow Bay Biological Station, which had experts in the field of entomology, aquatic organisms, algae and to some degree water chemistry, got about 40% of this allocation to do that type of work during the same period of time that we were going to do the fisheries habitat and fisheries inventory. The authorization was for a five-year study. The way the government works, none of the money was available until the appropriation which didn't come for about a year later.

Yes, authorization means you can do it, but appropriation is giving you the money to do it. The Corps of Engineers once described authorization as a hunting license to go looking for money.

The EPA (Environmental Protection Agency) finally received the appropriation and began to allocate the money and act as watch dogs over the project. Governor Schwinden was interested in the project and some of his staff came to our earlier meetings. He wanted to set up a commission of local people who lived in the Flathead Valley to act as a steering committee for the project expenditures.

We also started to draw up proposals for projects. Jack Stanford wrote one that related to the fauna and aquatic invertebrates and I wrote one that related to fisheries populations, fisheries habitat, water flows. Along with this EPA grant for the North Fork of the Flathead and the impact that the coal mine might have, we had a meeting with the Bureau of Reclamation concerning the impact their reservoir discharges had on the survival of the kokanee spawning population; it was being impacted very severely with their increased withdrawal programs leaving the streams and the eggs high and dry for a long period of time without water to cover them. And we got a grant from Bureau of Reclamation for \$300,000 to do a three-year study on the impact of the reservoir discharge on salmon population. When the money finally was available we had a staff of 34 fisheries people to gather data in the field. When I started we had three biologists and when I left we had 33 biologists.

When I first came here in '65, the state had just started a program of stream habitat preservation where any government agency, federal or state, had to have a permit before they started working on stream crossings, streambanks, riprap. It was expanded to include all streams and waters under the Stream and Lake Protection Act and it also pertained to farmers. And they started giving us notice on every activity they were going to do on a stream. Primarily they weren't too concerned with lake shores, but

stream crossings and any project that was close enough to carry sediment into the streams. I probably spent a third of my time working on the Stream Preservation Act and Lakeshore Preservation Act with the private sector and the Soil Conservation Districts. It was time well spent because we got away from the undersized culverts; we got away from riprap in places instead of modifying a stream or controlling a stream. I am satisfied that I know we saved a lot of sediment in streams and a lot of damage to lakeshore property and docks and obstructing sediment movement around the lakeshore at Flathead Lake.

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Richard (Dick) Vincent

Dick Vincent started with the Department of Fish, Wildlife and Parks in 1966. This interview was conducted on October 26, 1994.

Dick, let's start where you grew up.

I was born in Bozeman in 1940 and grew up in the Gallatin Valley. My father decided to take up mining and moved over to the Deer Lodge valley and we lived in the Garrison area from 1948 through 1958 when I graduated from high school. I lived there another year and then decided to go to college. I started college in 1959 after being out of school for a year. Graduated in 1963 with a Bachelor's Degree – at that time it was Montana State College.

And how did you get started working for the Department of Fish and Game?

In 1960, I worked as a summer laborer in Glasgow for Cliff Hill, the manager of that area. I also worked in other regions in the summer when I was going to school.

You went back to school for your Master's?

Yes, I went back to school in 1964. I skipped a year between Master's and Bachelor's program. Graduated in

1966 with a Master's Degree and started with the department. The first permanent job was actually stationed in Bozeman. I've been in Bozeman my entire career. Bud, who was the district manager at that time hired me to work on large rivers to develop electrofishing gear and fish population estimate techniques.

Up until this time every region had experimented with their own method of trying to shock large rivers. It was a sideline for each fish manager and none of them had a good solution. Finally it was decided that it should be a primary job of one person and that was you.

We began the fish population estimates by experimenting with various electrofishing gear, boats, electrodes, and population type estimates. The first estimates in 1966 were just experiments. Rather than a vacuuming system where you just electrofished everything out, we went to a mark and recapture system, which involved long sections of river. In many cases, like the Madison and the Yellowstone Rivers, three to four miles of river were

electrofished and estimates were made on very long sections. The mark and recapture, where fish are marked, you return after a period of a week or so and recaptured and marked to get the estimates. And frankly that was the beginning in Montana of estimates in large rivers where we had little or no data. Most of the data we had prior to that was where we had a count instead of an estimate of the number of fish. And there you were restricted to areas that you could walk.

Your estimate was for that section of stream? Did your method use block nets?

No block nets. In fact, we used the concept that the edge affect of a fish escaping either up the start of the section or out the end of the section was minimal. So you really didn't worry about that. With the method where you extracted all the fish or did a fish count, you did a block, but it would lower your estimate. This technique discounted that because the edge affect was so small in relation to total population. The few that would escape were of little or no importance.

You developed the gear and the method that changed our whole picture.

Well, sometimes in a river you really don't know what's in there. You hear both complaints and compliments on how good or bad a fishery is. If you don't know what's in it sometimes your guess isn't much better than the fisherman's guess. These techniques and estimates gave us the ability to have some real insight into what was going on. We started looking at the Madison River on three different aspects. First, what effect river flows had on wild populations. Most biologists first thought that poor flows meant poor fish

populations. But we were probably not able to document that without this technique. On the Madison we did so, about 1968, Bud Gaffney and I met with the president of the Montana Power Company which operated reservoirs on the Madison system. We illustrated if they would change their flow regime we might well see improved trout population throughout the entire river. What we were seeing with the fish population estimates, when MPC stored water too early, like February, March or April, prior to snowmelt runoff period, they'd often dewater the river up to 50 percent resulting in heavy losses of brown trout and rainbow trout. There were significant losses of adult trout. We asked MPC to readjust their flows. Frankly without estimates and without this information, they probably wouldn't have been very tolerant, but they did readjust them.

I remember the meeting and how cooperative they were; it was your data that did it.

I remember a statement such that well, data will fly, but opinions don't.

You also had good information on the quality of the SCS snow surveys, when you showed MPC we weren't asking them to give up water, it was a question of storing water at different times. They didn't have to lose any power generation.

Yes, as it turns out, they were able to do a better job to manage the system. Often in years where they looked out the window and didn't see enough snow, they'll hold water, it turns out that looking out the window wasn't very accurate and they would overhold. Then they'd have to spill huge amounts later in the spring and sometimes vice versa was true, it looked good from the operator's viewpoint out the

window but actually there wasn't much water and it was a shortfall. We provided them an avenue for better management of their system. They didn't lose anything and that was the convincing factor to them.

Tell us about the other things that began to amaze you about the fish populations of the Madison.

We figured after we got the good water flows everything would be fine and the populations of the river would respond. But that wasn't totally true. The area from Madison Dam to the mouth actually did respond quite well to improved flows -- populations increased nearly 50 percent. But the area that was most popular to anglers which was from Ennis Dam upward to Hebgen showed little improvement except for very small fish. It did show improvement but these small fish never manufactured bigger fish so we were puzzled as to why good flows really helped the lower river but had no real affect on the heart of the river which was the middle Madison. So we proceeded to continue to gather information and looked at various factors like maybe the middle river was overfished versus the lower river; maybe there was a pollutant; maybe there were some other factors controlling the middle river that we weren't aware of; it came down to one factor. The middle river was heavily stocked by the put and take type of fishery or catchable fishery whereas the lower river being it wasn't as interesting to anglers wasn't stocked; and we posed a theory that stocking of catchable rainbow trout could be harmful to wild trout populations. Thus we set up a study that involved not stocking about a 10 mile section of the Madison River near Varney Bridge and conversely stocking a section of the small spring creek where we had more population data and which hadn't been stocked for a long period of time, to see

how the population with stocking compared to the no stocking in the Varney section of the Madison River.

Did the experiment that tested your hypothesis on one part of the river cause any great controversy?

I never realized that but when we look back 20 - 25 years, it was very controversial not to stock 10 miles of a river. The reaction by the public was unbelievable. There were people that would take any means to protest what you were doing. Often an electrofishing crew would stay in a small town like Ennis and West Yellowstone and we were unwelcome visitors, quite frankly, just because we were doing such a study. Our tires would be messed with, our boat trailers would be messed with, and we were yelled at.

Was it hard to live in the community and do your work?

Yes, whether you were eating a meal or playing pool in a bar, you were not welcome. Planting catchables was so ingrained in the public at that time; of course, we had pushed it that way 10 years earlier when hatcheries planted small fish everywhere but then we realized it was ineffective and decided if we were going to plant anything it would have to be a catchable size. So we pushed the hatcheries into it and people were happy and couldn't believe anything was wrong with it. I was amazed that they would object at that point. We were just trying to find out the cause of the low population.

It was so controversial that the Fish and Game Commission had to make the decision to stock the Varney section.

Yes, many of the public perceived we were trying to prove a point. Actually what we were doing was try to find

out what the problem was. We had to eliminate one factor that clearly stood out as a highly possible problem. In order to find this out we had to do the study. It amazed me, people didn't want to tell you anything. I remember motel owners, restaurants and gas stations thought they would be out of business in no time. They feared if we quit stocking even small sections, the public would no longer come.

The meetings were wild – just living in Ennis during the week was wild. Meetings were almost to the point of violent, at times. Sometimes the people running the meetings wanted a certain viewpoint and you could get tossed out of the meeting if your viewpoint was incorrect in their minds.

You were finally allowed to do the studies?

It was very interesting and I had a feeling about the study but obviously until you run it through you have no idea what will happen. The study involved six total years of information; six years of no stocking on O'Dell Creek and six years of stocking and the converse on the Varney section of the Madison. Interesting enough, when we quit stocking the Madison, populations of wild trout, both rainbow and brown just started to explode. Numbers of larger brown trout and rainbow trout increased 200 to 400 percent within three years after stocking ceased. On the converse, with O'Dell Creek where we stocked, populations were halved within two to three years. Based on that information, it was pretty obvious that stocking catchables didn't have a place in wild trout management. I think that probably led to the '73 or '74 action by the Commission to limit stocking of catchables to streams that weren't self sustained as far as wild trout were concerned.

Even with six years of data it wasn't easy to sell the Commission. I can remember Commission meetings in Ennis where locals just flat out didn't believe the data and would say that the Madison was a dying river and there's no fish in it because it wasn't getting stocked. It actually polarized the whole community. There were those who believed it strongly and those who believed just as strongly the other way. They thought it was all a lie and the data was wrong and information was fixed; there was an agenda to get rid of Hatchery fish and none of the above was true. Quite frankly it even polarized some professional people to some degree. There were people who didn't believe it, thinking the researcher was getting the wrong information. It was breaking new ground and it was hard to believe.

So, back to your efforts in the first variable pulsing gear.

My uncle worked with electronic equipment, so I thought I might utilize any avenue I could to develop new shocking, electrofishing gear. I told him about the idea of what could we do with electricity. He came up with some of these ideas of pulsing and half pulsing and actually built electrofishers and sold them for a while. Now companies actually make money on these electrofishers. I don't think my uncle has built one for 20 years.

Was Fisher the name of the one your uncle built?

He was developing them but he became bored with production, he just liked to invent. The perception of the public was interesting, "if you can't stock fish, you can't have fish." That was ingrained in their minds. Many of the people in the guiding business and all the support industries in Ennis near the river really felt that without stocking there would be nothing. "You couldn't support a fishery on just

wild fish alone. People wouldn't come here." One thing that has been shown since 1974 is that, yes, they will and they have come in increasingly large numbers. In fact, I suspect if you walk into the town of Ennis today and suggested stocking fish you would be equally unwelcome as I was when I suggested the converse.

I think you're right. There was an article in a national magazine about the manager of the federal Hatchery at that time as the man who made the Madison.

Right. It's just amazing how the public will move along but they are very slow at accepting new ideas. Certainly the new idea of wild trout management was different. They saw that fish were being stocked and felt that without the Ennis Hatchery and without catchables, it'd be a dead town. I remember quite a few individuals in town who swore that this program would be the end of town and the fishery of the Madison. But then at public meetings, I've heard people get up and admit that this is the best thing that every happened to Ennis and the Madison River -- to go back to wild fish. But the whole program couldn't work without the basic data and the basic water flows. All along most biologists felt that if you had good habitat and water everything would work out in the end and that's pretty well proven down the road.

That certainly was proven at the Madison. Well, were there other phases of your work you'd like to add?

Right after we finished most of this work, the next phase was the special regulations. Prior to 1975 or 1976, special regulations in the sense of reducing limits or the type of gear you could use was pretty minimal or nonexistent in Montana. And throughout the U.S. probably with some

exceptions. About that time there were a lot of complaints in the Madison that we had lots of fish but they wanted bigger fish. Our estimates showed a lot of fish, definitely an improvement over what it was during the stocking years. We decided we had better look at things and do some estimates in the areas where they were complaining. Some of the early findings in '75 or '76 found that yes, in fact, fisherman were having an impact on larger fish; we found during the summer periods from May, June, July and August, 70% of the larger fish, fish over 10", were actually being removed or something happened to them. They weren't there by fall and we felt these were extravagant mortality rates. We devised an unique study in which we actually closed six miles of the Madison River to fishing; just shut it down. I remember thinking about it quite a bit. I walked into the office one day, back to the coffee room and told them my idea. "You've got to be out of your mind to try something like that," they said. But we needed to find out if anglers were the true culprit of large mortalities in the summer and if we tried a new regulation, would it approach no fishing at all. We could look at no fishing and try to impose a regulation that would mock it as close as possible. So the thing had a lot of potential and the next step was to sell it to the public. I was surprised, after the first round proposing no stocking study, I was a little hesitant. It was so, even by '75 the no stocking was starting to get popular because the proof of good fishing is by fishing; people were starting to catch fish and saying that the river was better than it's ever been; so the credibility of the department had risen a number of levels; they bought into it rather easily. I think we closed it in 1977 and reopened it in 1984. During those years of closure some interesting things occurred; one, we found that the population from overfishing can rebound in two years; so it

isn't a catastrophe by any means to overfish a stream; the population is very resilient, had good reproduction; we did come up with some different twists in regulations after the study. We found that basically catch and release at that point in time and with that fishing pressure mocked no fishing at all. Probably we could have gotten by with some keeping of fish but we decided not to do that. Over a period of years, the no fishing section looked much like the year we fished with catch and release. The downside of this whole study and I regret parts of the special angling regulations today, because if I look back at 30 years since I've been on the Madison River the thing that sticks in people's mind the most besides no stocking is special regulations. The thing that sticks in their mind the least is better flows. That gravels me. I've seen books written by numerous guides and outfitters that the Madison was made by catch and release fishing and that's full of crap as far as I'm concerned. Fishing regulations is a nice tool but they don't have much to do with population densities. In fact, total biomass today is no better than it was prior to catch and release. All it did is rearrange biomass into sizes that anglers like better. It had little to do with carrying capacity of the stream or anything.

In the future maintaining flows will be easier to go with than special regulations. Some people believe all streams can be saved with special regulations. The root of the problem is habitat, whether water or channels. That's been the downside to the whole area of special regulations. It clouded people's minds as to what is the real important issue. I still think people buy closure as important, but we just get constant requests, if they see something going bad whether drought or catastrophe then if we close it, everything will be fine. We've run studies where that didn't help at all. The

habitat was the bottom line and without the good habitat no improvement in population was found.

Can you tell us what folks in Garrison thought about fishing the Clark Fork in '54.

I grew up fishing the Madison River and when we moved over to Garrison in the early '50s one of my major disappointments was being confronted with the Clark Fork River. The river basically was an ugly mess -- it was yellow, the local joke was that if you were a fisherman on the Clark Fork you obviously had to be from some other state or some other area. Only a fool would fish the river, there's nothing in it. I had a high school teacher who was interested in fishing and he also taught chemistry and various science classes. We did some projects with water quality in the river and found a lot of arsenic and copper in the river. You could throw tin cans in the water in Garrison and they'd come back and they'd be copper plated. There was one company, the tin can express, they'd have these truckloads of cans and they would take them up near Warm Springs near Butte and dump them in the river and come back later and collect the cans which were now copper plated. They did a fairly good business that way, around '54, '55, '56. And that's before the Anaconda Company put in their precipitator. That's probably where the company got their idea. Somewhere about '57 and '58 the company started extracting their own copper. We could see noticeable improvements in the river and actually there were some trout that could be caught in the Garrison area. I wouldn't say there were huge amounts but you could go fishing in the river. I don't ever remember fishing the river prior to '57.



Bruce May

Bruce started with the Department of Fish, Wildlife and Parks in 1969. This interview was conducted on April 21, 1995.

Bruce, let's start out with where you grew up and how you got into the fisheries business.

I grew up in a little town outside Cincinnati, called Mack, Ohio. It's actually just a crossroads community. We had a bunch of little creeks and wood lots around the corn fields. My buddies and I would spend most of our summer days running up and down the creeks fishing for yellow bullheads, bluegills and creek chubs. In high school we got to be serious bass fisherman; there weren't a whole lot of good bass waters so we used to sneak into these private lakes at night in the summer and fish with jitter bugs and hoola poppers. After that I went to school at Ohio State and graduated with a Bachelor's and Master's Degree. A position opened up in Montana and I was hired and started in Dillon. Then I moved to the northwest and started working on the Libby Dam project on the impacts of resident fish populations. We developed a plan to help mitigate the losses to the river fishery on the Kootenai. Everybody camped out a lot working on different tributary development projects and our sampling programs on Lake Kookanusa.

How many years were you able to stay on contract funding?

About 21 years. I managed to hang out here in northwest Montana on contract. Once in a while it got a little tenuous at the end of the contract. We always were able to come up with the money or start another project so it really wasn't as insecure as some people thought it was. Compared to my Father who was a carpenter and had to change jobs every six months.

Secure, from that standpoint.

Everything is relative in this world, as you know. I enjoyed working up in Libby far away from everybody; my supervisor Joe would come up every couple weeks. I had a project outline but I had a lot of freedom and at the same time a lot of responsibility. We worked on developing spawning runs for cutthroat in tributaries both above and below the dam. We had one experimental tributary where we ran the fishtrap and got some good information on the life history of westslope cutthroat. We did a lot of sampling following the change of fish population in the reservoirs.

Probably the most important thing we did was pioneered night shocking on the major river systems in Montana. We were the first ones to do population estimates on the large rivers at night. The reason we had to work at night was the river was so deep and wide that we couldn't collect enough; we couldn't get enough fish marked to make a decent estimate. So we found out that if we went out at night the fish seemed to come in and lay along the banks more. In the shallow water they weren't near as spooky and we were able to collect lots and lots of fish and get enough marked and tagged to make a population estimate.

Until that time, the shocking system of marking and recapture was strictly daylight work in somewhat smaller rivers. Your work up here took a certain amount of additional fortitude. You used underwater lights at night, too, which may have helped attract fish.

Yeah, like anything else, when you first go out there's the fear and trepidation of the unknown. Once you've done it enough and feel comfortable with it then it gets to be rather routine, but you have to be more alert at night. The main thing you have to do is to really know the river well; you have to know where the big rocks are, you have to know where the ripples start and where they end so you really have to become intimate with the river; at least the Kootenai, the way the configuration of the bottom is to go out there and do a good job and under safe conditions so you don't lose anybody. We had a few interesting incidents, not accidents, where we almost got caught sideways on the rock once up the bridge coming over the Fisher River and I thought the boat was going to tip over. Another time we banged into the bridge culvert pretty good. It only took a few of those lessons to make you realize it was important to get out and

survey the river in the day time and in different flows so you knew where the hazards were.

So the person who was operating the boat does all that, since the rest of the crew are dipping fish and looking into the pool or lake where the fish appeared.

It was amazing some nights you'd go out and we did our best when the fish would be concentrated more in the quiet water and along the shore in the back waters and if we had a dark rainy evening sometimes you'd go down there and it was just incredible that fish were coming up so fast; you couldn't net 1 out of 10; under the right conditions it's really an excellent technique for collecting fish and getting basic populations. Information on numbers and estimates in the spring and fall; every year you could consistently get annual mortality rates and age composition, data that you need to manage fishery on large rivers that has lots of fishing pressure.

Were you in the Libby area during the gas supersaturation project?

Well, that was pretty wild. When they first closed the gates on Libby Dam and they started running the water through the spillway basin, and it fell about 120 feet or more and then during the fall of course, air got trapped in it and it went down in this cup shape. In the stilling basin it rolled over on itself and there was enough water pressure to force the air into supersaturation. Right below the dam there the concentrations depending on the time of year and flow would run 125-135% total gas saturation. Of course, the next day or so after they started doing this they had sculpins, whitefish and a few trout scattered all up and down the river; obviously it caused a lot of concerns with us and with all the

local people too. We could have easily said all the fish are dead in the river. But we didn't get a chance to go in and sample for about six months and finally they dropped after spring runoff in the summer, they dropped the water, the flow went down and it was in the middle of December before we could get in and sample. It so happened we had a cold spell and it was about -10 to -15 degrees below zero on the river and we were out night-shocking for about four nights. With ice flows coming down the river, it was a pretty interesting time. Anyway, we found out we couldn't do populations estimates but we could get some species composition data and catch rate data and it seemed to indicate that the whitefish had suffered the most mortality. Some trout mortality but we couldn't pin it down or anything. At least there was quite a few fish left and alive in the river and that was good to know.

Well, in late winter it could have been lethal if you had dumped the boat.

Yes that was a real dangerous time.

Probably today with OSHA regulations you wouldn't be allowed to do the same things. We're extremely fortunate we wound up without any problems.

Yes, especially in December when it was -20 degrees below zero. The engine could have kicked off and we'd been in trouble if we got into one of the tight spots on the river in front of a bridge pillar or something. Somehow the Lord looks out for drunks and foolish fish biologists. We spent a lot of the next two or three years, laughing and calling ourselves experts on the affect of gas supersaturation on large inland rivers. We did a lot of good work and presented some papers at AFS [American Fisheries Society] meetings.

We probably helped add to the knowledge of the impact of gas supersaturation on resident fish populations.

Do you remember what the Corps of Engineers solution was to that stilling basin that caused the gas supersaturation?

Yes. Once they got the generators installed, they could run the water through the generators. It took the energy when the water came through the generators; it took most of the velocity or energy out of it and it didn't plunge into that big pool. It came through the penstocks of the generators and it solved the problem. It probably didn't trap air on its way to the generators like it does on a free fall off the face of the dam.

The Corps of Engineers had an ideal solution to the stilling basin. Instead of a bunch of concrete or rocks the water just fought with water and it did a wonderful job of taking energy out, it just happened to put a lot of gas into the water.

Yes. We still had some problems, now and then, if the prediction of inflow during spring runoff was low and sometimes they had to spill some to run the generators a lot so the concentrations never really got up to the lethal level after that.

Just a small portion went through the spillway?

Yeah. Maybe it might get up to 110% or 115% but it didn't seem to affect the fish population, especially the trout, at that level. Since most of the trout were more sensitive when they were juveniles it appeared less, nearly all the spawning was in tributary streams.

So, after your tour at Libby you were transferred to the Kalispell area?

Yeah, that's where I entered the modern age of fish biology and get familiar with computers. We had a project to determine the impact of water level fluctuations on the biota of Hungry Horse Reservoir. Developing a model of the reservoir fluctuations and how it impacted depths, wetted bottom, surface area, temperature regimes, and how this was transferred through primary production of the insects plankton fauna in the westslope cutthroat trout growth. I started on it in 1983 and I worked on it until 1990. We contracted with folks at MSU to do the modeling for us and we did the data collection. We sampled year round; followed the spawning runs of bull trout and cutthroat up into the south fork of the Flathead and the Bob Marshall.

One of our more tougher jobs was going up every summer into the south fork for a week to ten days, angling, mostly dry fly fishing where we marked and released cutthroat. We'd make recapture runs either by angling or by using scuba gear to count the number of fish with tags, which are the marked fish versus the number of unmarked. During the study we'd go up for a week or two sampling; camp out or stay at the cabins around Hungry Horse. I really enjoyed being out like that -- getting away from the hustle and bustle of Kalispell, which was a culture shock to me since moving from Libby. It turned out that the information we collected and the modeling we did is being used by the Corps of Engineers today. They devised a scenario for reservoir operations and plug our model into it and come up with some pretty good ideas of what impacts the different reservoir operations will have on the biota of Hungry Horse Reservoir.

When you retired from that job you were still on what we call soft money, contract money?

Yeah. That may be my most famous claim with the department.

If you had it to do over again, can you think of anything you'd rather do?

Absolutely not. It was wonderful experience, with wonderful people, in what used to be the last best place. And we never ran out of beer.

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